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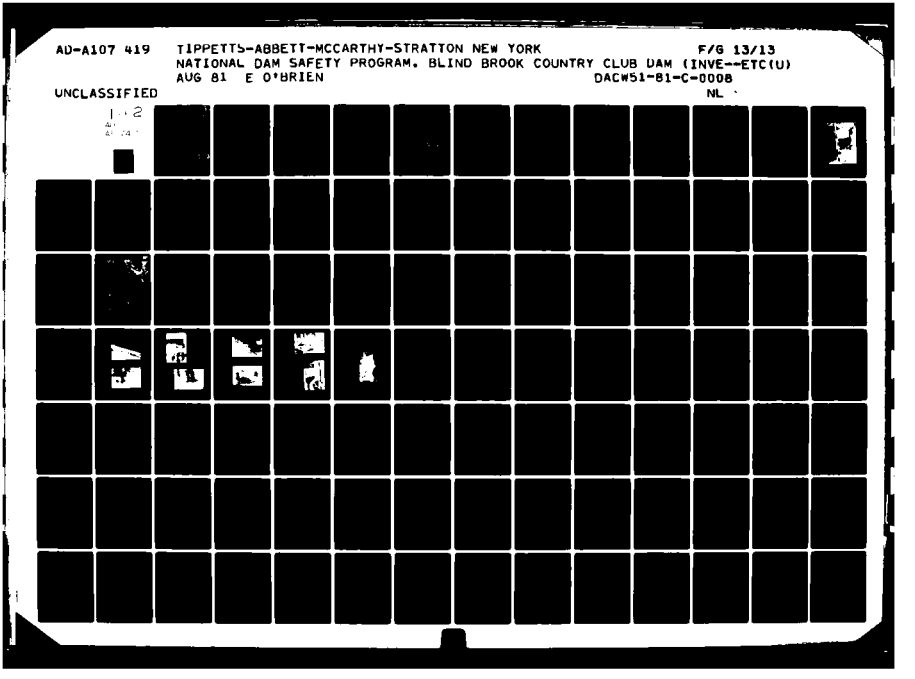

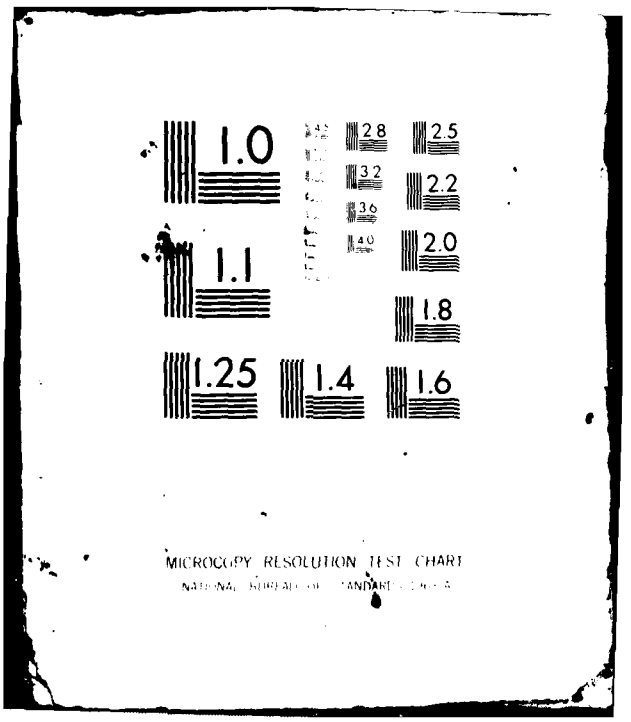
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LEVEL II

LONG ISLAND BASIN

BLIND BROOK COUNTRY CLUB DAM

WESTCHESTER COUNTY, NEW YORK
INVENTORY NO. N.Y. 123

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

NEW YORK DISTRICT CORPS OF ENGINEERS

JULY 1981

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A107 429
3. RECIPIENT'S CATALOG NUMBER	
4. TITLE (and Subtitle) Phase I Inspection Report. Blind Brook County Club Dam Long Island Basin, Westchester County, NY Inventory No. 123	5. TYPE OF REPORT & PERIOD COVERED Phase I Inspection Report National Dam Safety Program
	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) EUGENE O'Brien (10)	8. CONTRACT OR GRANT NUMBER(s) (15) DACW51-81-C-0008
9. PERFORMING ORGANIZATION NAME AND ADDRESS Tippetts-Abbett-McCarthy-Stratton The TAMS Building 655 Third Avenue New York, New York 10017	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Department of the Army 26 Federal Plaza New York District, CofE New York, New York 10287 (11)	12. REPORT DATE 05 August 1981
	13. NUMBER OF PAGES (12) 105
14. MONITORING AGENCY NAME & ADDRESS (If different from Controlling Office) Department of the Army 26 Federal Plaza New York District, CofE New York, NY 10287	15. SECURITY CLASS. (of this report) UNCLASSIFIED
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; Distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) (6)

National Dam Safety Program. Blind Brook Country Club Dam (Inventory Number NY 123), Long Island Basin, Westchester County, New York. Phase I Inspection Report.

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Dam Safety
National Dam Safety Program
Visual Inspection
Hydrology, Structural Stability
Blind Brook County Club Dam
Westchester County
Long Island Basin

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report provides information and analysis on the physical condition of the dam as of the report date. Information and analysis are based on visual inspection of the dam by the performing organization.

The examination of documents and the visual inspection of Blind Brook Dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigations and remedial actions.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

Using the Corps of Engineers Screenig Criteria for the initial review of spillway adequacy, it has been determined that the dam would be overtopped for all storms exceeding approximately 17 percent of the Probable Maximum Flood (PMF). The spillway is therefore adjudged as "seriously inadequate" and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a "seriously inadequate" spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean, however, that based on an initial screening and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard for loss of life downstream from the dam.

The structural stability analysis based on available information, assumed strength parameters and visual inspection indicates that the stability against sliding and overturning of the spillway section of the dam is inadequate for normal loading cases and marginal during floods greater than 25 percent of the PMF.

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D. C., 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigations, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I Investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through frequent inspections can unsafe conditions be detected and only through continued care and maintenance can these conditions be prevented or corrected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
BLIND BROOK DAM
I.D. NO. N.Y. 123
N.Y. D.E.C. NO. 232C-2747
BLIND BROOK BASIN
WESTCHESTER COUNTY, N.Y.

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APPENDICES

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

NAME OF DAM:	Blind Brook (N.Y. 123)
STATE LOCATED:	New York
COUNTY LOCATED:	Westchester
STREAM:	Blind Brook
BASIN:	Long Island Basin
DATE OF INSPECTION:	02 April 1981

ASSESSMENT

The examination of documents and the visual inspection of Blind Brook Dam did not reveal conditions which constitute an immediate hazard to human life or property. However, the dam has some deficiencies which require further investigations and remedial actions.

Using the Corps of Engineers Screenig Criteria for the initial review of spillway adequacy, it has been determined that the dam would be overtopped for all storms exceeding approximately 17 percent of the Probable Maximum Flood (PMF). The spillway is therefore adjudged as "seriously inadequate" and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a "seriously inadequate" spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean, however, that based on an initial screening and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard for loss of life downstream from the dam.

The structural stability analysis based on available information, assumed strength parameters and visual inspection indicates that the stability against sliding and overturning of the spillway section of the dam is inadequate for normal loading cases and marginal during floods greater than 25 percent of the PMF.

It is therefore recommended that within 3 months of notification to the owner, a detailed hydrological and hydraulic investigation be undertaken to more accurately determine the site specific characteristics of the watershed and their affect upon the overtopping potential of the dam. At the same time,

a structural stability study of the spillway section should be performed. Within eighteen (18) months of the date of notification to the owner, any modification to the structure deemed necessary as a result of investigations, to achieve a spillway capacity adequate to discharge the outflow from at least one-half (½) PMF, should have been completed. In the interim, a detailed emergency action plan and warning system should be promptly developed. Also, during periods of unusually heavy precipitation, around-the-clock surveillance should be provided.

In addition, the dam has a number of problem areas which, if left uncorrected, have the potential for the development of hazardous conditions and must be corrected within twelve (12) months.

The following recommended measures should be initiated immediately:

1. Monitor at biweekly intervals with the aid of weirs or other measuring devices the seepage which is occurring at each of the abutment contacts. Document this information for future reference.

2. Monitor by visual inspection the leakage through the structural cracks and vertical and horizontal lift lines along the downstream face. At the time when the reservoir is emptied, inspect the upstream surfaces to determine if the cracks are continuous through the dam. Document this information for future reference.

3. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain and its control facilities. Document this information for future reference. The aforementioned emergency action plan should be maintained and updated periodically during the life of the structure.

Eugene O'Brien, P.E.
New York No. 29823

Approved by:

Col. W.M. Smith, Jr.
New York District Engineer

05 AUG 1981

Date:

OVERVIEW

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM
BLIND BROOK DAM
I.D. NO. N.Y. 123
N.Y. D.E.C. NO. 232C-2747
LONG ISLAND BASIN
WESTCHESTER COUNTY, N.Y.

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

The Phase I inspection reported herein was authorized by the Department of the Army, New York District, Corps of Engineers Contract No. DACW 51-81-C-0008 in a letter dated 14 December 1980 in fulfillment of the requirements of the National Dam Inspection Act, Public Law 92-367 dated 8 August 1972.

b. Purpose of Inspection

This inspection was conducted to evaluate the existing condition of the dam, to identify deficiencies and hazardous conditions, to determine if these deficiencies constitute hazards to life and property and to recommend remedial measures where required.

1.2 DESCRIPTION OF THE PROJECT

a. Description of the Dam and Appurtenant Structures

Blind Brook Dam is a concrete gravity structure consisting of a center spillway section flanked on each side by a non-overflow section. The dam is approximately 130 feet long, 32 feet high and has a maximum base width of 20 feet. The crest of the dam is 4.5 feet wide.

The spillway is an ogee-type structure consisting of 9 foot long by 3 foot wide overflow sections separated by vertical concrete piers which support a concrete walkway approximately 2 feet above the crest. The crest level of the two middle sections (El 229.5) is approximately 6 inches below the crest level of the adjacent four sections (El 230). A concrete apron is located at the base of the spillway structure and extends 6 feet downstream of the dam.

A concrete pumping platform is located at the top of the dam directly above the two center overflow sections. The platform is cantilevered upstream from the dam crest and supports pumping machinery and control facilities for the reservoir drain.

The reservoir drain for the project consists of a 36-inch diameter steel pipe located at the base of the dam. A center rising screw-type valve is operated from the pumping platform and regulates discharge through the pipe.

The spillway discharges into a rock channel which runs perpendicular to the axis of the dam.

b. Location

Blind Brook Dam is located in the town of Purchase, Westchester County, New York. The dam is located off Anderson Hill Road, approximately 0.5 miles east of the Connecticut-New York State boundary.

c. Size Classification

The dam is 32 feet high and the reservoir has a storage capacity of 26 acre-feet. The dam is classified as "small" in size (26 to 40 feet).

d. Hazard Classification

The dam is classified as high hazard due to the large number of homes located 1000 feet downstream from the dam.

e. Ownership

The dam is owned and operated by the Blind Brook Country Club, P.O. Box 229, Purchase, N.Y., 10577, Tel. (914) 939-1566. The person to contact is Mr. Sabato Antorino, Superindentent of Maintenance.

f. Purpose of Dam

Blind Brook Dam creates a pool for irrigation of the Blind Brook Golf Course.

g. Design and Construction History

The dam was designed by Moran, Proctor, Mueser and Rutledge, Consulting Engineers (presently known as Mueser, Rutledge, Johnston & DeSimone), 415 Madison Avenue, New York, New York. The constructor of the dam is unknown. According to available documents, the dam was completed in 1959.

h. Normal Operating Procedures

According to Mr. Sabato Antorino, the reservoir is drained each fall to allow for storage of spring runoff. It was also reported that the reservoir is lowered prior to periods of high precipitation.

1.3 PERTINENT DATA

a. Drinage Area, Square Miles 1.79

b. Discharge at Damsite, cfs

Maximum Known Flood at Damsite	Unknown
Spillway (Maximum Pool: Top of Dam)	670 cfs
Reservoir Drain (Maximum Pool)	Unknown

c. Elevation, USGS Datum, MSL

Top of Spillway:	
Middle Two Sections	229.5 feet
Adjacent Four Sections	230 feet
Top of Non-Overflow Section	232.8 feet

d. Reservoir

Length of Maximum Pool	350 feet
Length of Normal Pool (El 107.5)	350 feet

e. Storage

Maximum Pool	50 acre-feet
Normal Pool	26 acre-feet

f. Reservoir Surface

Maximum Pool	Unknown
Normal Pool	Unknown

g. Overflow Section

Type	Ogee-type
Width	3 feet
Length	54 feet
Height	32 feet
Slope: Upstream (H:V)	1:24
Downstream (H:V)	7:12
Apron	Concrete

h. Non-Overflow Section

Length:	
Left Section	32 feet
Right Section	32 feet
Crest Width	4.5 feet
Platform Width	7.0 feet

i. Low Level Outlet

Type	Steel
Diameter	36-inch
Closure	Gate Valve
Reservoir Drain	Unknown

SECTION 2 - ENGINEERING DATA

2.1 GEOLOGY

Blind Brook Dam is located in the New England Upland Section of the New England Maritime Physiographic Province[4]. The bedrock in this Section consists of metamorphic, igneous and sedimentary rocks which have undergone a complex sequence of deposition, folding, faulting and erosion. The rock at the damsite is sound, hard, massive gneiss of Precambrian Age[5]. This rock is exposed at the abutments as well as upstream and downstream of the dam.

2.2 SUBSURFACE INVESTIGATIONS

A subsurface exploration program was performed during initial design of the dam. The borehole data which were obtained are shown on the boring logs presented in Appendix A.

2.3 DESIGN RECORDS

The construction drawings which exist for the project are presented in Appendix A.

2.4 CONSTRUCTION RECORDS

Construction records are not available for the project.

2.5 OPERATION RECORDS

No operation records exist for the project.

2.6 EVALUATION OF DATA

The information obtained from the available documents and a visual inspection is considered adequate for a Phase I inspection and evaluation.

There are two inconsistencies in the available drawings: (1) Plate 3 indicates four overflow sections, whereas six sections were observed during the visual inspection, and (2) the elevations shown on the drawings are different from those shown on the USGS Glenville Quadrangle Map, and is probably due to different datums. (For the purpose of this report, USGS datum is used except where noted.)

SECTION 3 - VISUAL INSPECTION

3.1 FINDINGS

a. General

A visual inspection of Blind Brook Dam was made on 2 April 1981. The weather was sunny and clear and the temperature was 65°F. At the time of this inspection, the reservoir level was approximately one inch above the crests of the two center spillway sections.

b. Dam

The structural condition of the visible portions of the spillway is considered to be good (See PHOTOGRAPHS 1 and 2). Surficial deterioration of concrete at vertical and horizontal joints exists on the downstream face, but is not considered to be serious (See PHOTOGRAPHS 3 and 4).

The general condition of the non-overflow section is also good. Some structural cracking does exist along the downstream face of the right section. Leakage has occurred through these features as evidenced by the staining and efflorescence which exist along these cracks (See PHOTOGRAPHS 3 and 5).

The vertical and horizontal alignment of the crest is good. The concrete along the dam crest and along the surfaces of the cantilevered platform is also good (See PHOTOGRAPH 6).

No emergency action plan exists for the project.

c. Appurtenant Structures

The gate valve for the reservoir drain was operated during the inspection. The lifting of the gate and discharge through the drain appeared normal. The crank wheel used to operate the valve is located at the Blind Brook Country Club Maintenance Shed. The pumping machinery and its supports appear to be in good condition (See PHOTOGRAPH 6).

d. Downstream Channel

The downstream channel of the spillway is Blind Brook. The channel contains natural boulders and fallen trees, and for the most part, is clear of debris (See PHOTOGRAPH 7).

e. Reservoir Area

The reservoir area consists of flat to gently rolling terrain. Immediately upstream and downstream of the dam are outcrops of bedrock. The slopes in the reservoir area appear stable, with no signs of past movements. There appears to be no sedimentation problems in the reservoir area.

f. Abutments

Seepage was observed occurring at both the right and left abutment contacts about one or two feet below the top of the dam (See PHOTOGRAPHS 8 and 9). The quantity of flow at each location could not be measured, but is estimated to be less than 1 gpm. The seepage appears to be occurring through the discontinuities in the rock at the abutment contacts. Since the abutments are hard rock, little to no erosion is occurring at these locations.

3.2 EVALUATION OF OBSERVATIONS

Visual observations made during the course of this inspection did not reveal serious problems which would adversely affect the adequacy of the dam and its appurtenant facilities. The following summarizes the encountered problem areas, in order of importance, with the recommended remedial action:

1. The seepage which is occurring at each of the abutment contacts should be monitored periodically with the aid of weirs or other measuring devices. Document this information for future reference.

2. Monitor by visual inspection the leakage through the structural cracks and vertical and horizontal lift lines along the downstream face. At the time when the reservoir is emptied, inspect the upstream surfaces to determine if the cracks are continuous through the dam.

3. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain and its control facilities. Document this information for future reference. Develop an emergency action plan and periodically update during the life of the structure.

SECTION 4 - OPERATION AND MAINTENANCE PROCEDURES

4.1 PROCEDURES

No written operation and maintenance procedures exist for the project. The normal operation of the project consists of allowing water to flow over the spillway. According to Mr. Antorino, the reservoir drain is used to lower the reservoir in anticipation of major storms and also each November to drain the reservoir.

4.2 MAINTENANCE OF DAM

It is reported that maintenance of the dam is performed when the need arises. Although there is no formal procedure for maintaining the dam, the maintenance is considered to be adequate.

4.3 WARNING SYSTEM IN EFFECT

No warning system is in effect or in preparation.

4.4 EVALUATION

The overall condition of the dam and appurtenant structures appears to be good. Recommendations in connection with regular maintenance are discussed in Section 7.

SECTION 5 - HYDROLOGIC/HYDRAULIC

5.1 DRAINAGE AREA CHARACTERISTICS

The Blind Brook Dam is located on the Blind Brook just south of Anderson Hill Road and about 0.75 miles north of the Hutchinson River Parkway and the town of Rye in Westchester County, New York (Hydrologic Unit Code No. 02030102). The rectangular shaped basin extends north about 3-1/4 miles into Fairfield County, Connecticut. Maximum basin width is about 0.75 miles, and the area is 1.79 square miles. The average slope of the brook is about 0.012 ft/ft, rising from a normal pool elevation of 230 feet (MSL) to over 460 feet at the northern end of the drainage area.

The basin, as outlined on the USGS Glenville Quadrangle Map, is mostly undeveloped except for the Westchester County Airport.

5.2 ANALYSIS CRITERIA

The analysis of the adequacy of the spillway was performed by developing a design flood, using the unit hydrograph method and the Maximum Probable Precipitation (PMP). The all season, 200 square mile 24 hour PMP for Westchester County of 22 inches was obtained from Weather Bureau sources[2]. Snyder's unit hydrograph coefficient, developed for the Blind Brook Basin in a previous study[2] of 1.47 and 0.68 for C_T and C_p, respectively, were used for this analysis. Loss parameters of 2.0 inches and 0.17 inch/hour for the initial and constant losses were also adopted.

In accordance with the Recommended Guidelines for Safety Inspection of Dams[3], the adequacy of the spillway was analyzed using the Probable Maximum Flood (PMF). A multi-plan analysis was performed for the 0.25, 0.50, 0.75 and 1.00 PMF.

5.3 SPILLWAY CAPACITY

The ungated concrete spillway, with a crest elevation estimated to be 230 feet (MSL) is centrally located on the dam. The effective width of the spillway is 45.0 feet, with a 10 inch (0.83) thick walkway 2.0 feet above the crest. The computed maximum spillway discharge with the pond elevation at 232.83 feet (top of dam) is 670 cfs, or 16 percent of the PMF before the dam is overtopped.

5.4 RESERVOIR CAPACITY

The normal reservoir capacity is listed as 26 acre-feet at spillway crest elevation (230.0±) and 50 acre-feet at the top

of the dam (El 232.83). The surcharge storage between spillway crest and top of dam of 24 acre-feet is equivalent to about 0.25 feet of runoff over the entire drainage basin.

5.5 FLOODS OF RECORD

There are no records of floods or maximum reservoir elevations at the dam, however, at the Blind Brook gage at Rye (D/A 9.20 miles) approximately two miles downstream of the dam, the maximum recorded flood was 2,320 (about 40-50 percent PMF) on June 19, 1972.

5.6 OVERTOPPING POTENTIAL

The potential of the dam being overtopped was investigated on the basis of the spillway capacity and the available surcharge storage to meet the selected design flood inflows.

The analysis was performed assuming that (i) the water surface in the reservoir was at spillway crest elevation (230.0 feet) at the start of the flood event, and (ii) that the low level outlet was closed.

The PMF routed through the reservoir resulted in the dam being overtopped as follows:

RATIO OF PMF	PEAK INFLOW	PEAK OUTFLOW	OVERTOPPING
1.00	3901 cfs	3873 cfs	2.96 ft.
0.75	2926 cfs	3021 cfs	2.39 ft.
0.50	1959 cfs	1982 cfs	1.59 ft.
0.25	975 cfs	977 cfs	0.57 ft.

The spillway is capable of passing only 17.3 percent of the PMF before the dam is overtopped.

5.7 EVALUATION

The principal spillway of the Blind Brook Country Club Dam has insufficient capacity to pass either the PMF or one-half (1/2) PMF without overtopping the dam. The overtopping of the dam could cause the failure of the dam, thus signifcantly increasing the hazard for the loss of life downstream. The spillway is therefore assessed as "seriously inadequate" and the dam is assessed as unsafe, non-emergency.

SECTION 6 - STRUCTURAL STABILITY

6.1 EVALUATION OF STRUCTURAL STABILITY

a. Visual Observation

Visual observation did not indicate conditions which would affect the structural stability of the dam. The observed seepage at the left and right abutment contacts and the structural cracking along the downstream face of the right non-overflow section are not detrimental to the stability or safety of the dam at the present time.

b. Design and Construction Data

The original design computations regarding the structural stability of the dam are not available.

c. Operating Records

There are no operation records available. No major operation problems which would affect the stability of the dam were reported.

d. Post-Construction Changes

There are no recorded post-construction changes. However, the available drawings presented in Appendix A show that only four (4) spillway sections, rather than six (6) which were observed, were designed.

e. Seismic Stability

According to the recommended Corps guidelines, the dam is located in Seismic Zone No. 1; therefore, no seismic stability analysis for this dam was performed.

6.2 STRUCTURAL STABILITY ANALYSIS

A structural stability analysis on what was determined from the drawings to be the maximum typical section was performed. In addition the analysis was performed inaccordance with recommended guidelines (Ref. 3). The following tables list each of the cases analyzed and the results of the analysis.

Case	Description of Loading Conditions
I	Normal Loading, Lake Level at El 108.0, No Tailwater, Full Uplift
II	Same as Case I, with 5 K/LF, Ice Load
III	Unusual Loading, 1/2 PMF, Lake Level at El 112.42, Tailwater 6.6 Feet
IV	Extreme Loading, Full PMF, Lake Level at El 113.79, Tailwater 7.5 Feet

SUMMARY OF RESULTS

Case	Location of Resultant	Sliding Factor of Safety
I	2.27 feet Outside Middle Third	1.66
II	6.36 feet Outside Middle Third	1.44
III	7.97 feet Outside Middle Third	1.15
IV	10.33 feet Outside Middle Third	1.03

The results of the analyses indicate that the stability of the dam is inadequate in overturning and sliding for all loading conditions considered. The analysis, however, may not indicate the actual material properties of the foundation nor the actual loading conditions. Therefore, it is recommended that an in-depth engineering stability analyses of the structure be performed.

SECTION 7 - ASSESSMENT/RECOMMENDATIONS

7.1 ASSESSMENT

a. Safety

Phase I investigation of Blind Brook Dam did not indicate conditions which constitute an immediate hazard to human life or property. Based on engineering judgment and the performance of the dam, the project appears to be in fair condition. The project, however, does have inadequacies and deficiencies which, if not remedied, have the potential for developing into hazardous conditions.

Using the Corps of Engineers screening criteria for review of spillway adequacy, it has been determined that the dam would be overtopped for all storms exceeding approximately 17 percent of the Probable Maximum Flood (PMF). The overtopping of the dam could result in a failure of the dam thus increasing the hazard to loss of life downstream. The spillway is, therefore, adjudged as "seriously inadequate" and the dam is assessed as unsafe, non-emergency.

The classification of "unsafe" applied to a dam because of a "seriously inadequate" spillway is not meant to connote the same degree of emergency as would be associated with an "unsafe" classification applied for a structural deficiency. It does mean, however, that based on an initial screening and preliminary computations, there appears to be a serious deficiency in spillway capacity so that if a severe storm were to occur, overtopping and failure of the dam would take place, significantly increasing the hazard for loss of life downstream from the dam.

Structural stability analyses based on available information and the visual inspection indicate that the stability of the spillway section against overturning and sliding is inadequate for all loading conditions.

b. Adequacy of Information

The information and data available were adequate for the performance of this investigation.

c. Need for Additional Investigations

A detailed hydrological/hydraulic investigation of the structure should be undertaken to more accurately determine the site specific characteristics of the watershed. In addition it has been found on the basis of screening analyses of stability, that the overflow section of the dam does not meet current criteria under flooding conditions equal to half (1/2) PMF and PMF. Further analysis of the structural stability of the spillway should be performed at the same time.

d. Urgency

The additional hydrologic/hydraulic investigations and the structural stability investigations which are required must be initiated within 3 months from the date of notification. Within 18 months of notification, remedial measures as a result of these investigations must be initiated, with completion of these measures during the following year. In the interim,develop an emergency action plan for the notification of downstream residents and proper government authorities in the event of overtopping and provide around-the-clock surveillance of the dam during periods of extreme runoff. The other problem areas listed below must be corrected within one year from notification.

7.2 RECOMMENDED MEASURES

1. The results of the aforementioned remedial measures will determine the appropriate remedial measures required.

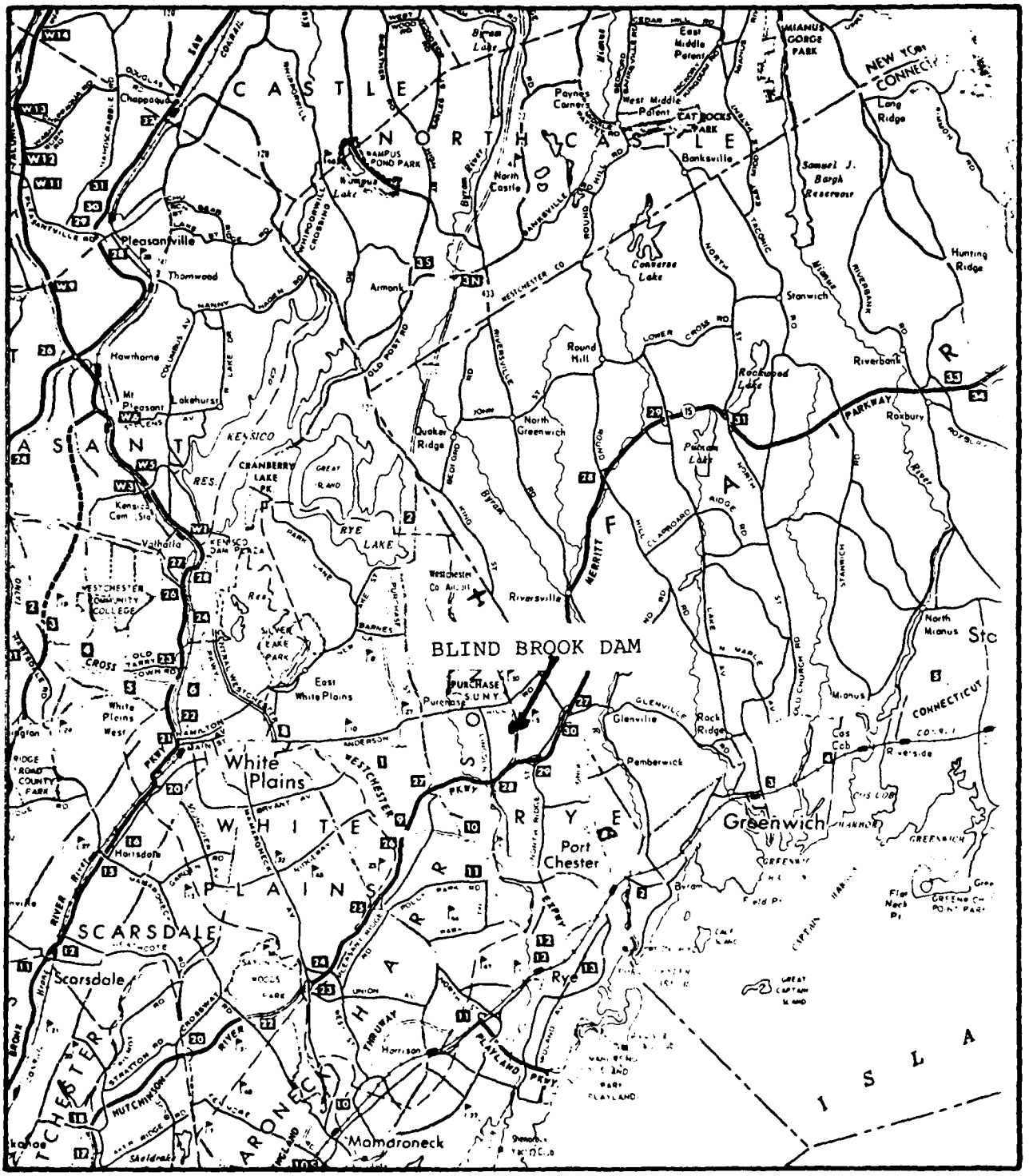
2. Monitor periodically with the aid of weirs or other measuring devices the seepage which is occurring at each of the abutment contacts. Document this information for future reference.

3. Monitor by visual inspection the leakage through the structural cracks and vertical and horizontal lift lines along the downstream face. At the time when the reservoir is emptied, inspect the upstream surfaces to determine if the cracks are continuous through the dam. Document this information for future reference.

4. Provide a program of periodic inspection and maintenance of the dam and appurtenances, including yearly operation and lubrication of the reservoir drain and its control facilities. Document this information for future reference. The aforementioned emergency action plan should be maintained and updated periodically during the life of the structure.

DRAWINGS

APPENDIX A



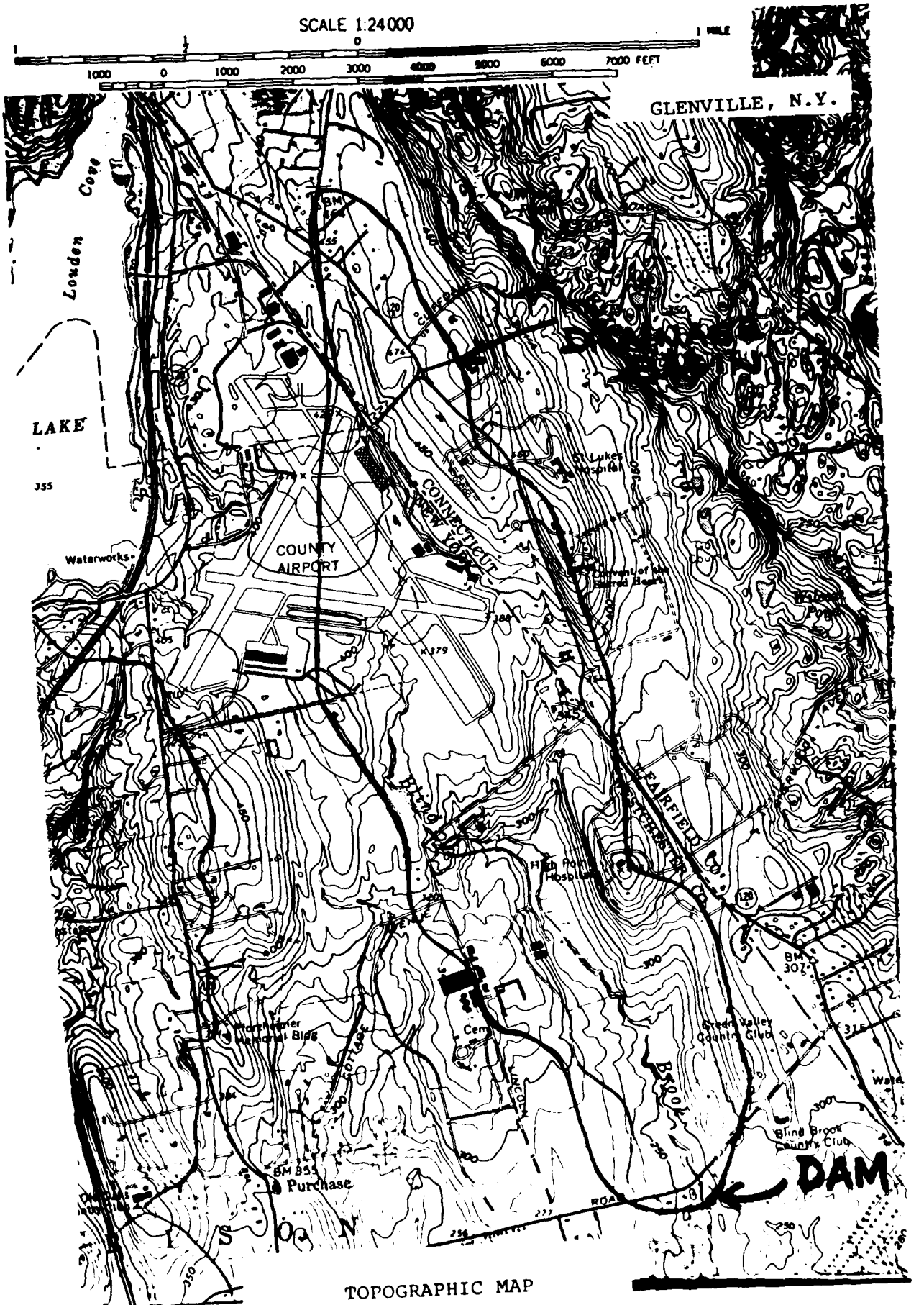
LOCATION MAP

Blind Brook Dam

Plate 1

SCALE

0 1 2 3 4 Miles



TOPOGRAPHIC MAP

BLIND BROOK COUNTRY CLUB DAM

PLATE 2

Form 8-A

SPRAGUE & HENWOOD, Inc.

SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: Turner Construction Co. LOCATION Harrison, New York

HOLE NO. 1 SURFACE ELEVATION 81.20 RIG NO. DATE From 10-10 To 10-14 No. 53

BORING LOG		SPOON SAMPLE AND CORE DATA					BLOWS IN CASING
DEPTH FROM-TO	DESCRIPTION OF MATERIAL	SAMPLE NUMBER	DEPTH FROM-TO	BLOWS PER FT. ON SPOON SAMPLES	CORE SIZE	CORE RECOVERY AND REMARKS*	
0 to 3'2"	Soft Decomp. Rock and "Fill"						
3'2" to 19'6"	Med. to Hard Rock						
						1st Run 3'2" to 8'2" Rec. 32" Pcs. 13 & Frags.	
						2nd Run 8'2" to 13'2" Rec. 18" Pcs. 7 & Frags.	
						3rd Run 13'2" to 19'6" Rec. 18" Pcs. 6 & Frags.	

GROUND WATER			PIPE AND CASING LEFT IN HOLE			Distance Hammer Drop 24-30 Inch
DEPTH	HOUR	DATE	SIZE	AMOUNT	REASON	Drive Hammer 300 Lbs.
						Spoon Hammer 300 Lbs.
						Casing Size 2½ Inch
						Spoon Size 2 Inch
						Size of Core Bit AX Inch

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under remarks, mention kind of bit, loss of sample, loss of drilling water, soft seam or broken rock, raving, cavities, unusual ground water conditions, etc., at depth encountered.

Driller Wilfred Biron

Helper Gilbert Miller

Helper

PLATE 3

Form A-A

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

FOUNDATION TESTING and SOIL SAMPLING RECORD

NAME: Turner Construction Co. LOCATION: Harrison, New York

HOLE NO. 2 SURFACE ELEVATION 82.35 RIG NO. 1 DATE: From 10-14- To 10-15 - 58

SORING LOG		SPOON SAMPLE AND CORE DATA						BLOWS PER CASING
DEPTH FROM-TO	DESCRIPTION OF MATERIAL	SAMPLE NUMBER	DEPTH FROM-TO	BLOWS PER FT. ON SAMPLES	CORE RECOVD WASH	UNDISTURBED REROD	TYPE OF CORE	REMARKS*
0 to 4'6"	Fill							
4'6" to 19'6"	Rock - Med. to Hard							
								1st Run 4'6" to 9'6" Rec. 36" Pcs. 13 & Frags.
								2nd Run 9'6" to 14'6" Rec. 6" Pcs. 3 & Frags.
								3rd Run 14'6" to 19'6" Rec. 26" Pcs. 13 & Frags.

GROUND WATER		
DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE		
SIZE	AMOUNT	REASON

Distance Hammer Drop 24-30 inch
Drive Hammer 300 Lbs.
Spoon Hammer 300 Lbs.
Casing Size 2½ Inch
Spoon Size 2 Inch
Size of Core Bit B Inch

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* under remarks, mention kind of bit, loss of sample, loss of drilling water, soft seams or broken rock, boring, cavities, unusual ground water conditions, etc., at depth encountered.

Driller Wilfred Birna
Helper Gilbert Miller
Helper

PLATE 4

Form 6 A.

SPRAGUE & HENWOOD, Inc.

SCRANTON, PA.

FOUNDATION TESTING & SOIL BORING RECORD

NAME Turner Construction Company LOCATION Harrison, New York

HOLE NO. 3 SURFACE ELEVATION 84.0 BEGUN 1 DATE 10-25 COMP. 11-13 SHEET NO. 50

BORING LOG			SPOON SAMPLE AND CORE DATA						CASING
DEPTH FROM-TO	DESCRIPTION OF MATERIAL	WATER	DEPTH FROM TO	RECOVERY PER FT. OF	BLOWS PER FT. OR CORE RECOVERY	CORE RECOVERY	NO. PCS.	TIME PER FT. OF CORE	
					REMARKS				
0 to 4'	Fill								
4' to 14'	Rock								
			1st Run 4' to 9' Rec. 26" Pcs. 10						
			2nd Run 9' to 24' Rec. 60" Pcs. 24						

GROUND WATER			CASING LEFT IN HOLE			
DEPTH	HOLE	DATE	SIZE	AMOUNT	REASON	

Distance Hammer Drop	24-32	Inch
Drive Hammer	300	Lbs
Spoon Hammer	300	Lbs
Casing Size	2½	Inch
Spoon Size	2	Inch
Size of Core Bit	B	Inch

NOTE: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under remarks, mention kind of bit, loss of sample, loss of position, water, soft seam or broken rock, voids, cavities, unusual ground water conditions, etc., at depths encountered.

Driller Wilfred Olson

Helper Gilbert Miller

Helper

PLATE 5

Form 1-A

SPRAGUE & HENWOOD, Inc.
SCRANTON, PA.

FOUNDATION TESTING & SOIL SAMPLING RECORD

NAME: Turner Construction Co. LOCATION: Harrison, New York

HOLE NO. 4 SURFACE ELEVATION 88.1 DATE: From 10-15 To 10-15 No. 58

BORING LOG — SPOON SAMPLE AND CORE DATA — BLOWS ON CASING

DEPTH FROM - TO	DESCRIPTION OF MATERIAL	SAMPLE NUMBER	DEPTH FROM TO	BLOWS PER FT.	DRIVE UNDISTURBED WASH ROD	TYPE CORE	BOULDER OR OBSTRUCTION REMARKS
0 to 6'	Fill						
6' to 16'	Rock						
			1st Run 6' to 11' Rec. 17" Rec. 16				
			2nd Run 11' to 16' Rec. 45" Rec. 24				

GROUND WATER

DEPTH	HOUR	DATE

PIPE AND CASING LEFT IN HOLE

SIZE	AMOUNT	REASON

Distance Hammer Drop	30	Inch
Drive Hammer	300	Lbs
Spoon Hammer	300	Lbs.
Casing Size	2	Inch
Spoon Size	2	Inch
Size of Core Bit	B	Inch

NOTES: *Classification of soil has been made by the driller and has not been checked by a soils engineer. Classification of rock has been made by the driller and has not been checked by a geologist.

* Under remarks, water kind of bit, loss of sample, loss of drilling water, soft seams or broken rock, swing, cavities, unusual ground water conditions, etc., & depth encountered.

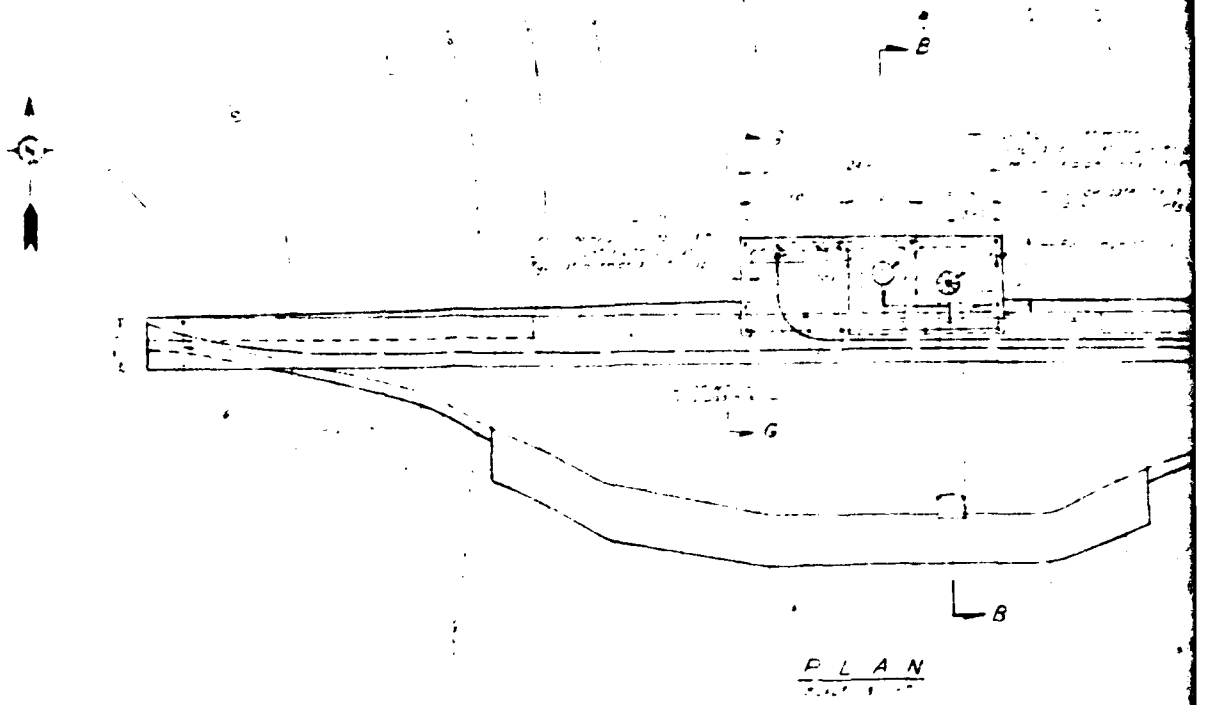
Driller Wilfred Biron

Helper Gilbert Miller

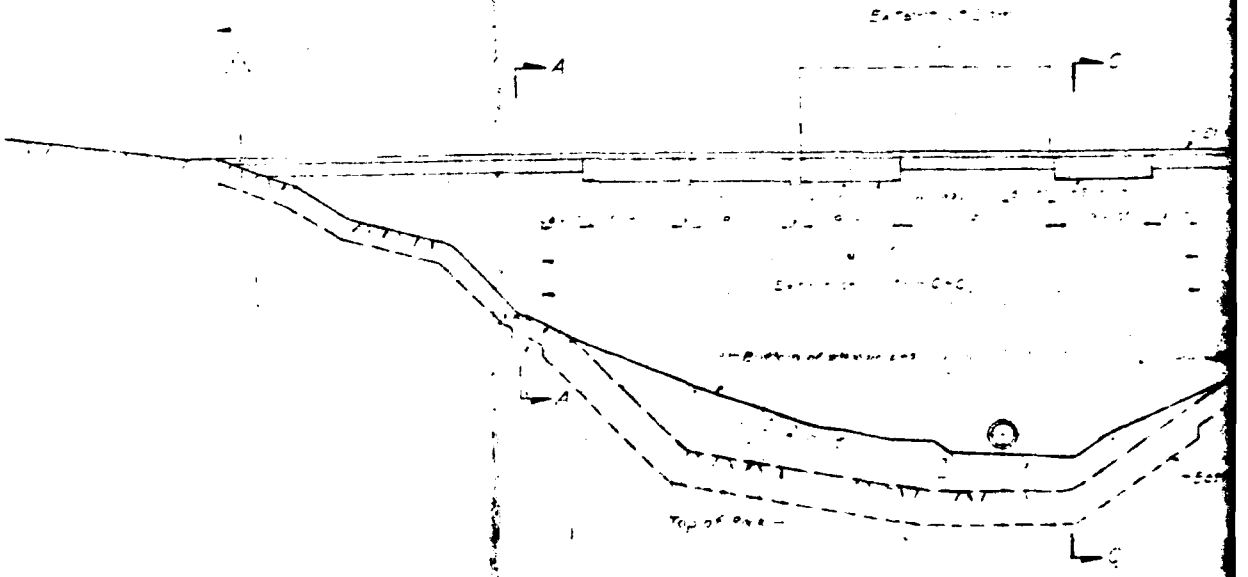
Helper

PLATE 6

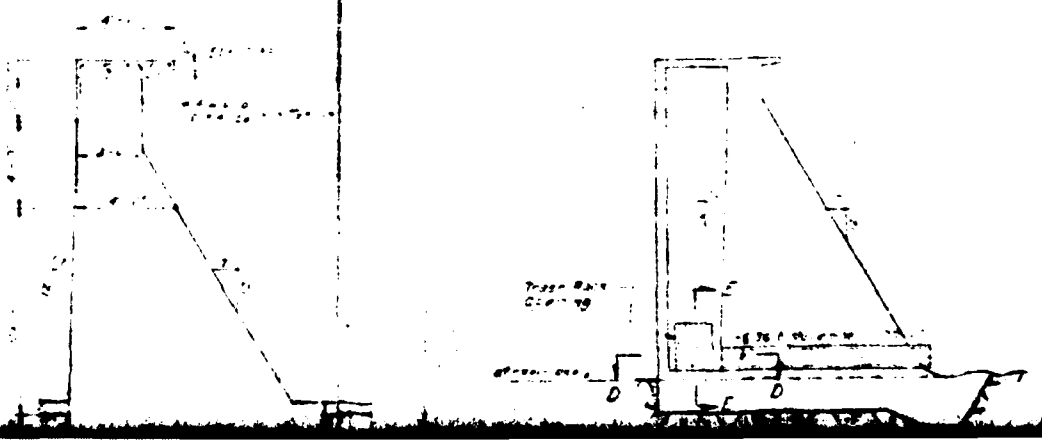
1

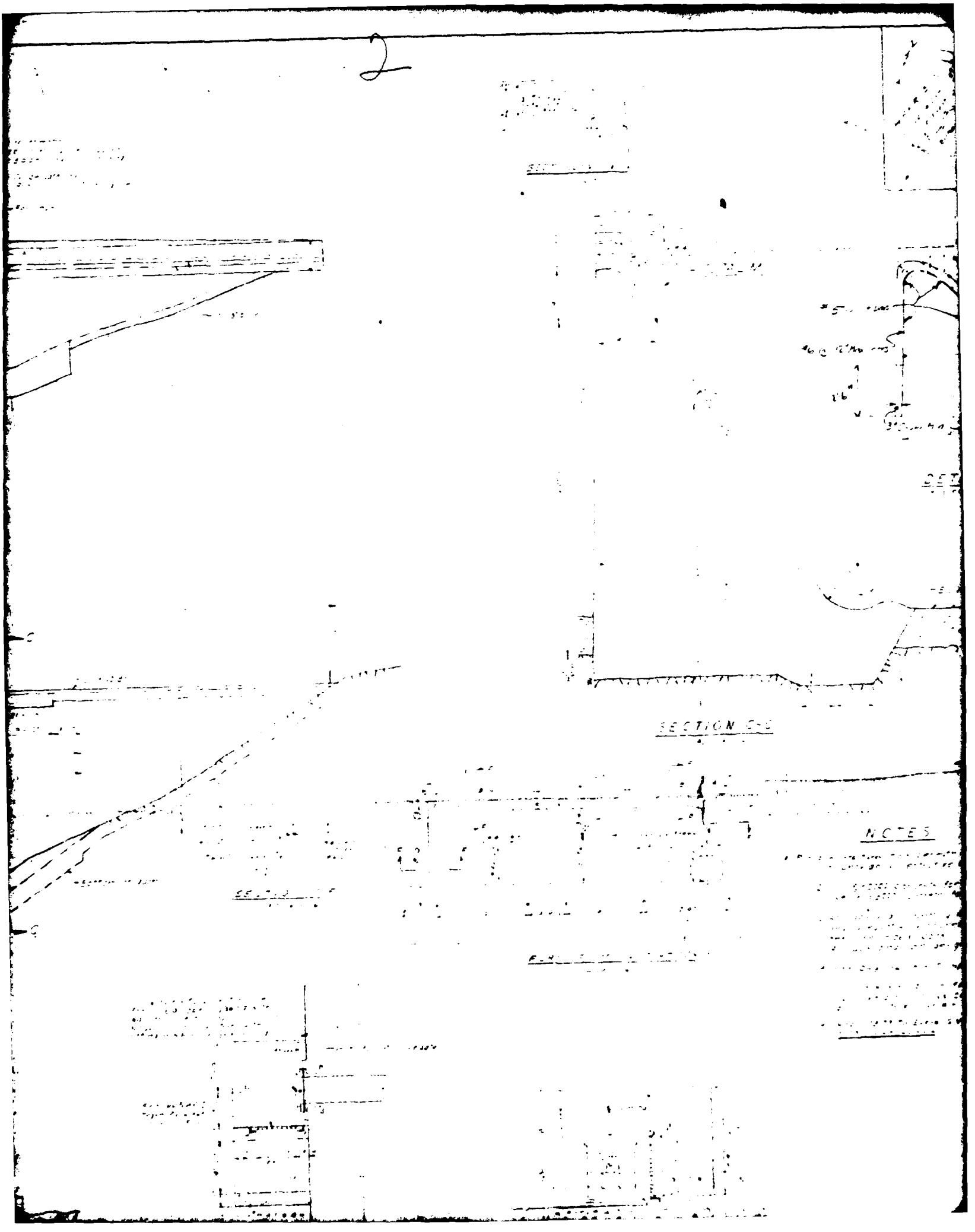


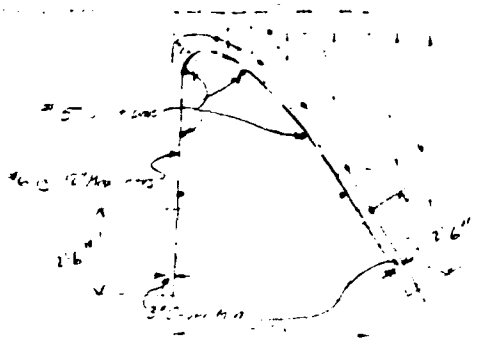
PLAN



ELEVATION




SECTION C-C
NOTES



DETAIL "W"

SECTION C-C

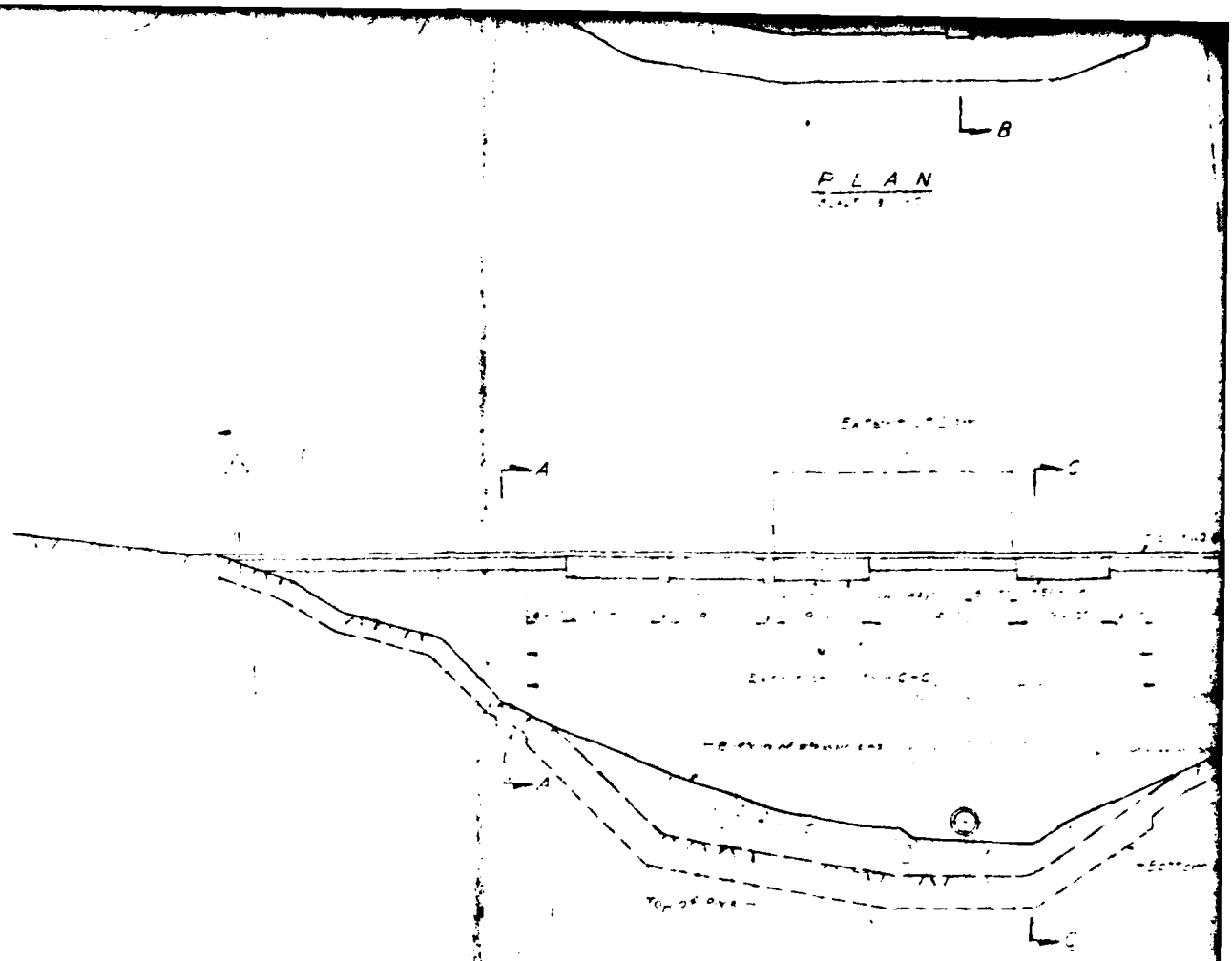
NOTES

Superseded by Sht 7 Dated Dec 17, 1918

STATE
DEPARTMENT
DIVISION

December 11, 1918

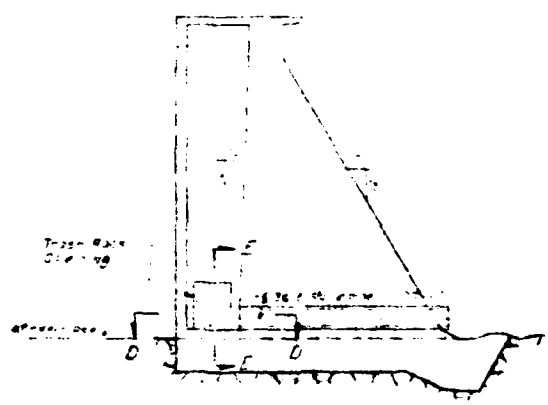
LONG BEACH HARBOR



PLAN

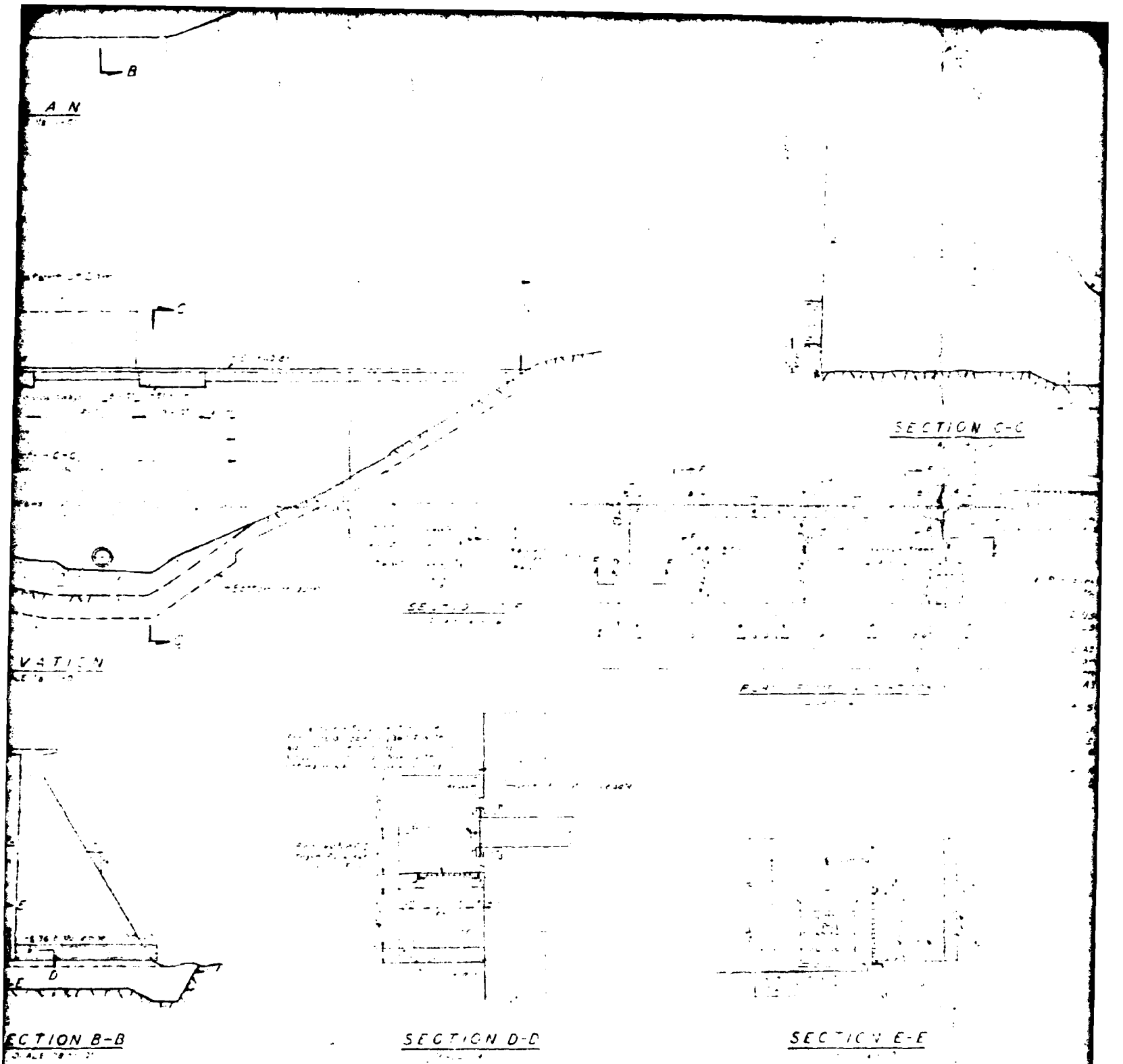
ELEVATION

SECTION A-A



SECTION B-B

4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SECTION C-C
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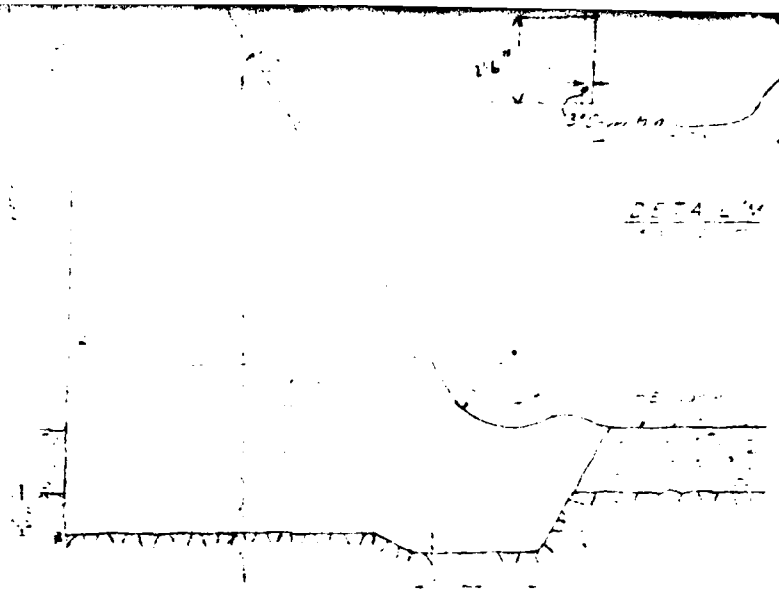
D
ECTION B-B
SECTION D-D
SECTION E-E



SECTION C-C

NOTES

Superseded by ... Dated ... Dec 17, 1958

STATE ...
DEPARTMENT OF ... WORKS
DIVISION OF ... CONTROL
ALBANY ... December 11, 1958

This plan ... is approved ... E224-2747
... LONG ISLAND SOUND ... pursuant to and by
authority of the provisions of Section 246 ... of the
Conservation Law.

Examined and recommended to the Chief Engineer for approval.

D. C. Colburn
ASSOCIATE CIVIL ENGINEER

APPROVED

CHIEF ENGINEER
Department of Public Works

By ...
Deputy Chief Engineer

SECTION E-E

BLIND BROOK COUNTRY CLUB

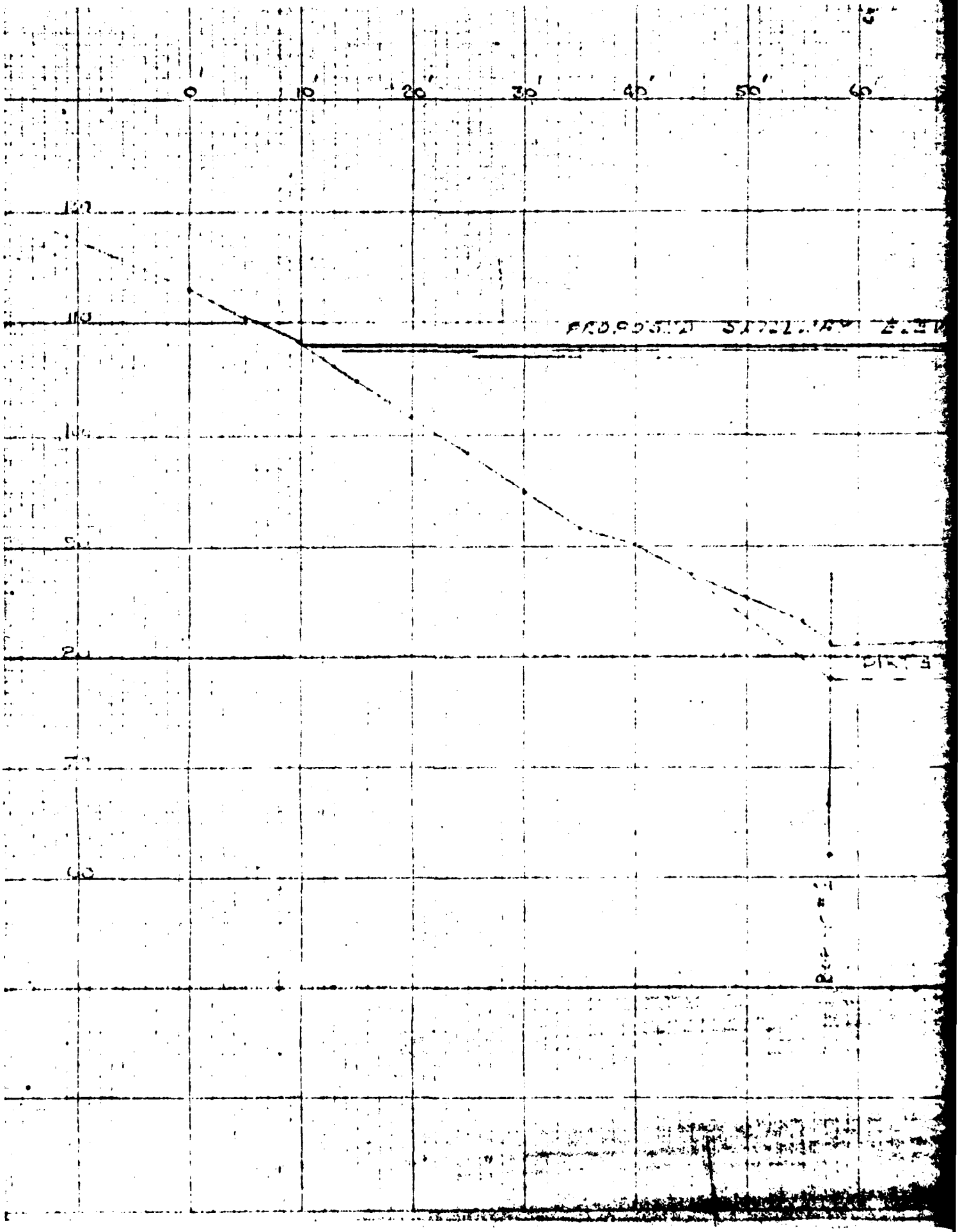
PORT CHESTER NEW YORK

MORAN, PROCTOR, MUESER & RUTLEDGE
CONSULTING ENGINEERS
419 MADISON AVE. NEW YORK 17, N. Y.

SCALE	MADE BY	DATE	FILE NO.
AS NOTED	CHKD BY	DATE	DEC. CL.
CONCRETE DAM			DRAWING NO. XX

5

Plate 7


0
10
20
30
40
50
60

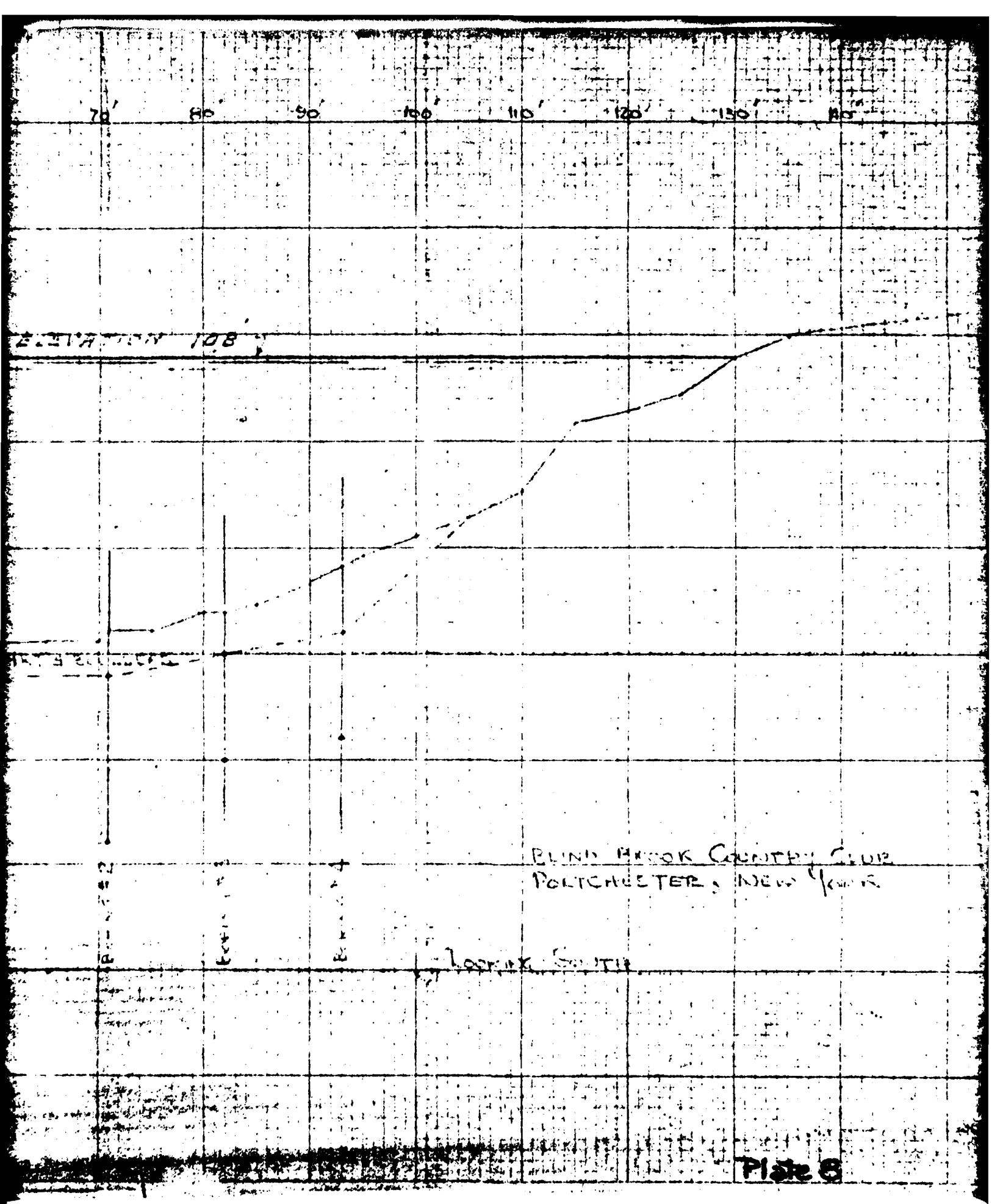
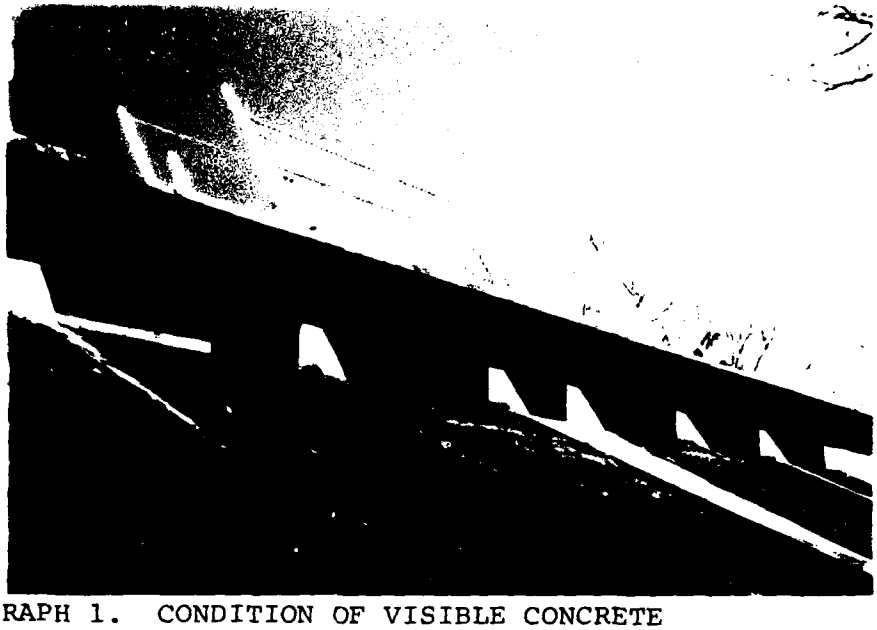

70'
80'
90'
100'
110'
120'
130'
80'
108'
BLIND BROOK COUNTRY CLUB
PORTCHESTER, NEW YORK.

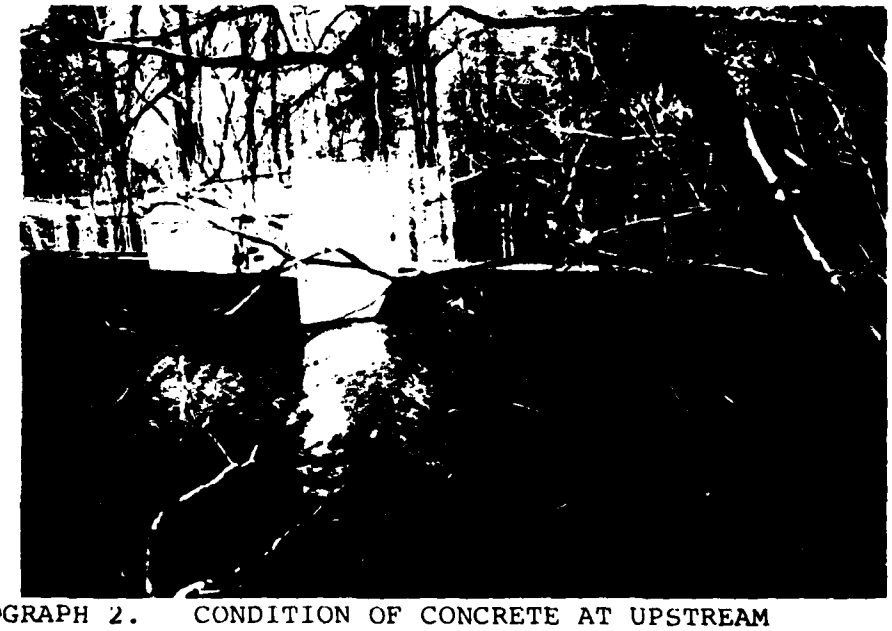
Plate 6

PHOTOGRAPHS

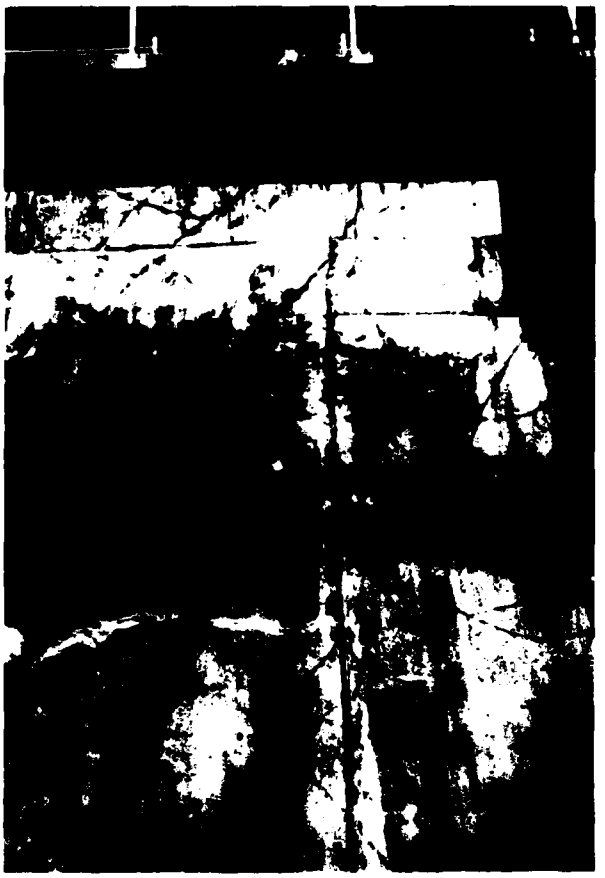
APPENDIX B



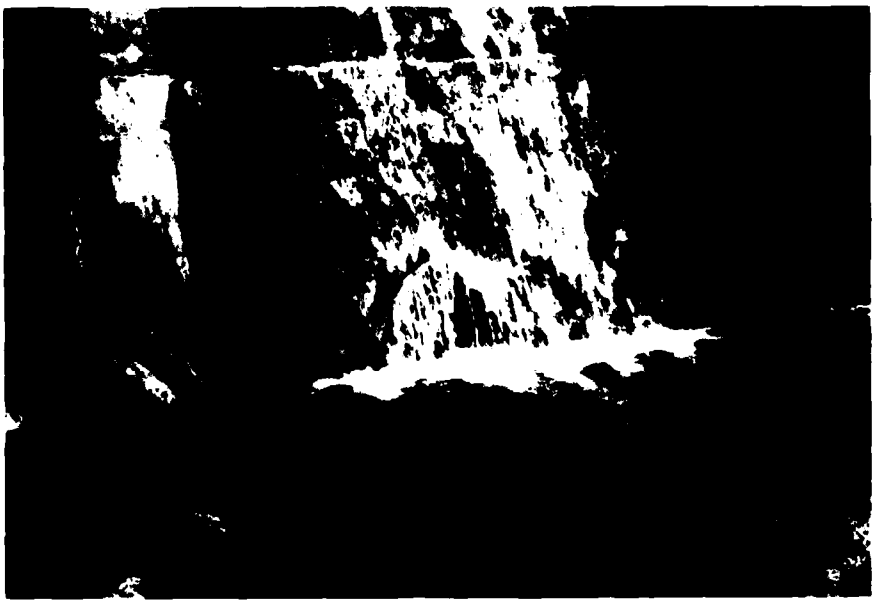
PHOTOGRAPH 1. CONDITION OF VISIBLE CONCRETE AT DOWNSTREAM FACE OF DAM



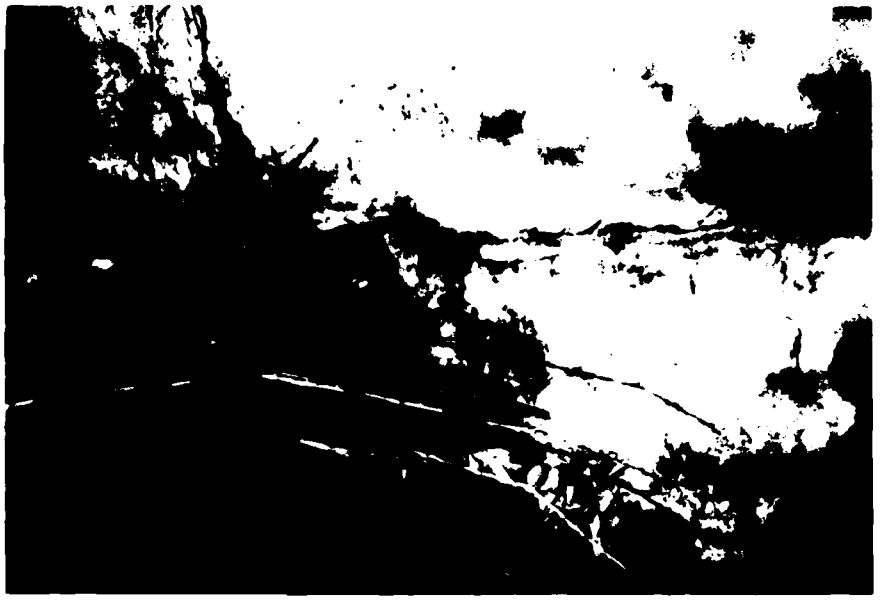
PHOTOGRAPH 2. CONDITION OF CONCRETE AT UPSTREAM FACE OF DAM



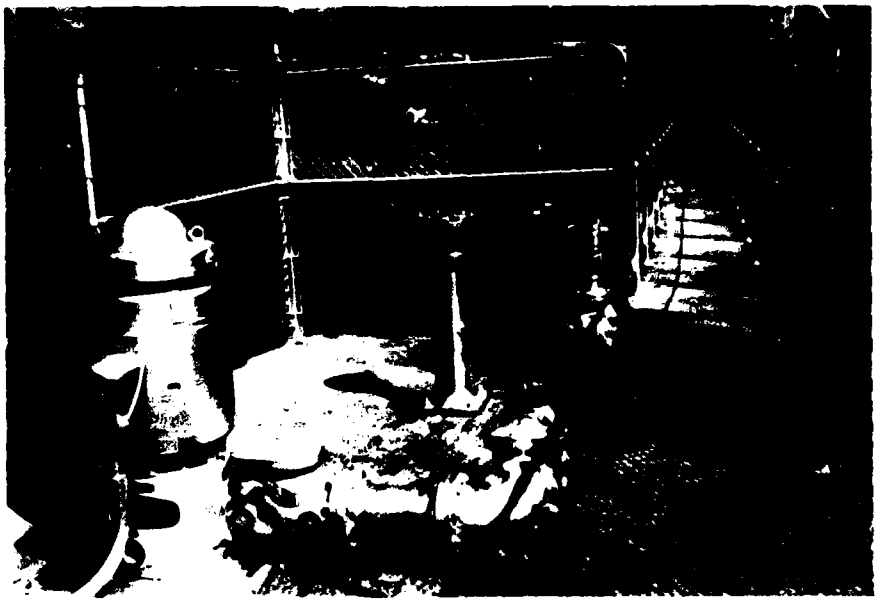
PHOTOGRAPH 3. STRUCTURAL CRACKING ALONG DOWNSTREAM FACE OF NONOVERFLOW SEC-SECTION



PHOTOGRAPH 4. DETERIORATION OF CONCRETE ALONG HORIZONTAL CONSTRUCTION JOINTS



PHOTOGRAPH 5. SEEPAGE THROUGH STRUCTURAL CRACKS IN RIGHT NONOVERFLOW SECTION



PHOTOGRAPH 6. CONDITION OF CONCRETE AT CREST (OBSERVE GOOD CONDITION OF MACHINERY)

PHOTOGRAPH 7. CONDITION OF DOWNSTREAM SPILLWAY CHANNEL

PHOTOGRAPH 8. SEEPAGE AT LEFT ABUTMENT CONTACT

PHOTOGRAPH 9. SEEPAGE AT RIGHT ABUTMENT CONTACT

VISUAL INSPECTION CHECKLIST

APPENDIX C

VISUAL INSPECTION CHECKLIST

1. Basic Data

a. General

Name of Dam Blind Brook Dam

Fed. I.D. # NY123 DEC Dam No. 232C-2747

River Basin Blind Brook Basin

Location: Town Purchase County Westchester

Stream Name Blind Brook

Tributary of Unknown

Latitude (N) 42°-02.1' Longitude (W) 073°-41.4'

Type of Dam Concrete Gravity Structure with 6 center ogee-type spillways each 9'x3' wide separated by thin vertical concrete walls approx. 2' high

Hazard Category High

Date(s) of Inspection 02 April 81

Weather Conditions Sunny, 65°F

Reservoir Level at Time of Inspection Couple of inches above spillway crest

b. Inspection Personnel Mr. Anthony Dolcimascolo and Mr. Al DiBernardo

c. Persons Contacted (Including Address & Phone No.)

Mr. Sabato Antorino - Superintendent (914) 939-1566

c/o Blind Brook Country Club

P.O. Box 229

Purchase, N.Y. 10577

d. History:

Date Constructed 1958/59 Date(s) Reconstructed Not Applicable

Designer Formerly: Moran, Proctor, Mueser & Rutledge / Presently Mueser, Rutledge, Johnston & De Simone

Constructed By Unknown

Owner Blind Brook Country Club

2 Embankment

a. Characteristics

(1) Embankment Material Not Applicable

(2) Cutoff Type Not Applicable

(3) Impervious Core Not Applicable

(4) Internal Drainage System Not Applicable

(5) Miscellaneous Not Applicable

b. Crest

(1) Vertical Alignment Not Applicable

(2) Horizontal Alignment Not Applicable

(3) Surface Cracks Not Applicable

(4) Miscellaneous Not Applicable

c. Upstream Slope

(1) Slope (Estimate) (V:H) Not Applicable

(2) Undesirable Growth or Debris, Animal Burrows Not Applicable

(3) Sloughing, Subsidence or Depressions Not Applicable

(4) Slope Protection Not Applicable

(5) Surface Cracks or Movement at Toe Not Applicable

d. Downstream Slope

(1) Slope (Estimate - V:H) Not Applicable

(2) Undesirable Growth or Debris, Animal Burrows Not Applicable

(3) Sloughing, Subsidence or Depressions Not Applicable

(4) Surface Cracks or Movement at Toe Not Applicable

(5) Seepage Not Applicable

(6) External Drainage System (Ditches, Trenches; Blanket) Not Applicable

(7) Condition Around Outlet Structure Not Applicable

(8) Seepage Beyond Toe Not Applicable

e. Abutments - Embankment Contact

Not Applicable

(1) Erosion at Contact Not Applicable

(2) Seepage Along Contact Not Applicable

) Drainage System

a. Description of System None

b. Condition of System None

c. Discharge from Drainage System None

Instrumentation (Monumentation/Surveys, Observation Wells, Weirs, Piezometers, Etc.) None

Reservoir

a. Slopes The reservoir slopes are relatively flat. The right slope (looking u/s) is part of the Blind Brook Golf Course. The left slope is wooded and flat to gently rolling

b. Sedimentation There were no visible signs of sedimentation. The reservoir is drained each November, thereby virtually eliminating sedimentation during the winter months

c. Unusual Conditions Which Affect Dam None

6) Area Downstream of Dam

a. Downstream Hazard (No. of Homes, Highways, etc.) There are a large number of homes downstream of the dam, which are visible from the damsite.

b. Seepage, Unusual Growth The downstream area is wooded with many large trees. No seepage was observed through d/s rock outcroppings or overlying soils. No boils were observed in soils.

c. Evidence of Movement Beyond Toe of Dam None observed

d. Condition of Downstream Channel The downstream channel consists of small to large boulders. There is minimal debris which should not restrict flow in the d/s channel. The channel width is medium-wide

7) Spillway(s) (Including Discharge Conveyance Channel)

The spillway consists of six overflow sections, each approximately 9 feet in width. The two middle sections are slightly lower in elevation than the adjacent sections. Each section is uncontrolled. The sections are separated by thin vertical

a. General concrete walls. The walls support the walkway at the top of the dam. Upstream of the 2 center spillway sections is a cantilevered concrete platform which supports pumping machinery and the reservoir drain control facilities.

b. Condition of Service Spillway The service spillway appears to be in good condition. There is little deterioration and erosion along the d/s surfaces. Since the reservoir is drained each winter season, little to no freeze-thaw action, and subsequent deterioration occurs. Although the upstream surfaces were uninspected, for the above reasons they they are believed to be in good condition. (See Sheet 7 for additional comments concerning structural cracks, etc.)

c. Condition of Auxiliary Spillway Not Applicable

d. Condition of Discharge Conveyance Channel See Sheet (5) topic (6) - "Area Downstream of Dam"

) Reservoir Drain/Outlet

Type: Pipe ✓ Conduit _____ Other _____

Material: Concrete _____ Metal ✓ Other _____

Size: 24" Length 25± feet

Invert Elevations: Entrance UnKnown Exit UnKnown

Physical Condition (Describe): Unobservable ✓

Material: Unobserved.

Joints: Unobserved Alignment Unknown

Structural Integrity: Appears to be in good condition. Mr Antorino operated the drain, flow appeared to be normal.

Hydraulic Capability: See Structural Integrity

Means of Control: Gate _____ Valve ✓ Uncontrolled _____

Operation: Operable ✓ Inoperable _____ Other _____

Present Condition (Describe): The valve is operational. The center rising screw (visible portions) appear to be well maintained

9) Structural

a. Concrete Surfaces The concrete surfaces are in good condition. There is little deterioration spalling or erosion of these surfaces, except at construction lift lines.

b. Structural Cracking Some structural cracking exists at the right nonoverflow section of the dam (Three major cracks were observed)

c. Movement - Horizontal & Vertical Alignment (Settlement) The vertical and horizontal alignments are good It is uncertain as to whether the forementioned cracks are due to settlement.

d. Junctions with Abutments or Embankments The dam appears to be tied in well with the rock abutments. There is a seepage condition at each abutment, however, as described below.

e. Drains - Foundation, Joint, Face None were observed nor shown on the drawings

f. Water Passages, Conduits, Sluices None

g. Seepage or Leakage Some seepage occurred at each of the abutment contacts. The seepage was estimated at less than 1gpm. It appears that at both abutments, the seepage is occurring in the discontinuities in the rock

h. Joints - Construction, etc. There appears to be some spalling/deterioration along vertical and horizontal construction lift lines. However, this does not appear to be a serious problem

i. Foundation The foundation of the dam is rock. It appears to be hard and resistant to erosion.

j. Abutments See (g)

k. Control Gates None

l. Approach & Outlet Channels None

m. Energy Dissipators (Plunge Pool, etc.) None

n. Intake Structures None

o. Stability The dam appears to be stable under the observed conditions

p. Miscellaneous None

10) Appurtenant Structures (Powerhouse, Lock, Gatehouse, Other)

a. Description and Condition Machinery and piping equipment for irrigation of the golf course are located at the east of the structure. This equipment is in excellent condition and is regularly maintained by Country Club personnel.

HYDROLOGIC DATA AND COMPUTATIONS

APPENDIX D

CHECK LIST FOR DAMS
HYDROLOGIC AND HYDRAULIC
ENGINEERING DATA

AREA-CAPACITY DATA:

	Elevation (ft.)	Surface Area (acres)	Storage Capacity (acre-ft.)
1) Top of Dam	232.8	Unknown	50
2) Design High Water (Max. Design Pool)	Unknown	Unknown	Unknown
3) Auxiliary Spillway Crest	Not Applicable (NA)	NA	NA
4) Pool Level with Flashboards	Not Applicable (NA)	NA	NA
5) Service Spillway Crest	230.	Unknown	26

DISCHARGES

	Volume (cfs)
1) Average Daily	UNKNOWN
2) Spillway @ Maximum High Water (TOP OF DAM)	670
3) Spillway @ Design High Water	Unknown
4) Spillway @ Auxiliary Spillway Crest Elevation	Not Applicable
5) Low Level Outlet	Unknown
6) Total (of all facilities) @ Maximum High Water	670+
7) Maximum Known Flood at USGS Gauge 06/19/72	2320
8) At Time of Inspection	Unknown

CREST: ELEVATION: 108±

Type: Ogee-type (six sections

Width: about 2 feet each Length: 9 feet Each

Spillover Uncontrolled

Location Center of dam

SPILLWAY:

SERVICE		AUXILIARY
108±	Elevation	
Ogee-type	Type	
9' x 6 sections = 54'	Width	

Type of Control

✓	Uncontrolled	

Controlled:

	Type (Flashboards; gate)	
	Number	
	Size/Length	
	Invert Material	
	Anticipated Length of operating service	
	Chute Length	
	Height Between Spillway Crest & Approach Channel Invert (Weir Flow)	

HYDROMETEROLOGICAL GAGES:

Type : None Used

Location: N.A.

Records:

Date - N.A.

Max. Reading - N.A.

FLOOD WATER CONTROL SYSTEM:

Warning System: None

Method of Controlled Releases (mechanisms):

36" metal pipe at base of dam and control facility at top of dam (center-rising screw-type valve)

DRAINAGE AREA: 1.79 square miles

DRAINAGE BASIN RUNOFF CHARACTERISTICS:

Land Use - Type: Mostly undeveloped Woodland + Meadow with County airport in N.W. corner

Terrain - Relief: rolling with gentle to moderate slopes

Surface - Soil: Glacial Till

Runoff Potential (existing or planned extensive alterations to existing (surface or subsurface conditions)

Unknown

Potential Sedimentation problem areas (natural or man-made; present or future)

Unknown

Potential Backwater problem areas for levels at maximum storage capacity including surcharge storage:

None

Dikes - Floodwalls (overflow & non-overflow) - Low reaches along the Reservoir perimeter:

Location: None

Elevation: _____

Reservoir:

Length @ Maximum Pool Unknown (Miles)

Length of Shoreline (@ Spillway Crest) Unknown (Miles)

TAMS

Job No. 1579-11 Sheet 1 of 19

Project BLIND BROOK DAM INSPECTION Date APRIL 0 81

Subject HYDROLOGIC/HYDRAULIC COMPUTATIONS By DLC

Ch'k. by

LAKE ELEVATION 230

PERIMETER 1000' ~ 0.19 mi

FETCH 350' ~ 0.07 mi

AREA ≃ 0.5 acres

DRAINAGE AREA 1.79 SQ MI

$L = 3.8$ miles

$L_{CA} = 1.98$ miles

$640 C_p = 435$ $C_p = 0.68$

$C_T = 1.47$

$T_p = 1.47\{(3.8)(1.98)\}^{0.3} = 2.69$

$t_\lambda = 2.69/5.5 = 0.489$ hours use $t_R = 0.5$

$t_{PR} = t_p + 0.25(t_R - t_\lambda) = 2.69 + 0.25(0.011) = 2.69275$ hrs

$T_{PR} = 2.69$ hrs $t_R = 0.5$ hrs

(SNYDER'S COEFFS ADAPTED FROM LOWER HUDSON RIVER BASIN REPORT)

FROM Hydrometeorological Report #33

Zone 1 All season 200 SQ MI 24 HR PMP = 22"

DURATION (HR)	6	12	24	48
% PMP	111	123	133	142

TAMS

Job No. 1579-11 Sheet 2 of 19

Project BLIND BROOK DAM INVESTIGATION Date APRIL 3 '81

Subject HYDROLOGIC/HYDRAULIC COMPUTATIONS By D.L.C.

Ch'k. by

RAINFALL LOSSES (from Ref 1)

Initial Loss – 2.0"

Constant Loss – 0.17 in/hour.

% impervious drainage area estimated to be 25% (~ 30 acres).

* Normal storage listed as 50 acre ft

* and max storage as 54 acre ft

CHANNEL X SECTION D/S by RESURRECTION CONVENT

	El.		
	190	0	470
	180	80	390
	170	180	150.
min	165	105	(El 168) 115

SLOPE ~ 60' in 3500 or 0.017

% PMF	MAX. EL	DEPTH
100	172.9	7.9 feet
50	171.6	6.6 feet

* "Wat. Resources Data for New York", NY-79-1

TAMS

Job No. _____ Sheet 3 of 19

Project BLIND BROOK COUNTRY CLUB DAM Date APR 14 81

Subject HYDROLOGIC / HYDRAULIC COMPUTATIONS By D.L.C

Ch'k. by _____

EFFECTIVE CREST LENGTH 54.0'.

CREST EL 230 MSL

FLOW OVER SPILLWAY WITH 2.0' HEAD.

$Q = 3.09 \times 36 \times 2^{3/2} = 315$ for 4 openings

$Q = 3.09 \times 18 \times 2.5^{3/2} = 220$ for 2 openings

AREA BELOW WALKWAY.

TOP OF WALKWAY EL 232.83

BOTTOM OF WALKWAY EL 232.0

$(18 \times 2.5) + (36 \times 2)$

$45 + 72 = 117$ ft²

PRESSURE FLOW BELOW WALKWAY use $C = 0.53$.

& $Q = CA\sqrt{2gH}$

$Q = (0.53)(117)\sqrt{64.4}\sqrt{11.0} = 673.18$

H measured from top of dam walkway (EL 232.83) to center of opening (EL 231.0)

SPILLWAY RATING TABLE

EL	DISCHARGE
229.5 ±	0
232.	535
232.83	673
242	1650

(AT EL 242 H = 242 - 231 = 11.0')

FLOW OVER DAM INCLUDES FLOW OVER WALKWAY = L = 130' + 54' = 184'

```
**********
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION      JULY 1978
  LAST MODIFICATION  01 APR 80
**********
    1  A1                                BLIND BROOK DAM PHASE 1 INSPECTION
    2  A2                                HEC-1DB  PMF ANALYSIS
    3  A3                                APRIL 1981 TAMS  1579-11
    4  B    100    -     0      30        0       0       0       0       0       0       0
    5  B1     5
    6  J      1      4      1
    7  J1     1    .75     .5     .25
    8  K      0      1                                                      1
    9  K1       1 BASIN RUNOFF
   10  M      1      1   1.79            1.79                                       1
   11  P             22    111     125     133     142
   12  T                                                          2    0.17              .025
   13  W  2.69     .68
   14  X     -1     -.1    1.5
   15  K      1      2                                                      1
   16  K1       2 RESERVOIR ROUTING
   17  Y                                     1       1
   18  Y1     1                                                           26      -1
   19  Y4   230     232  232.83     242
   20  Y5           535     673    1650
   21  SS    26      50      66
   22  SE   230  232.83     250
   23  SI   230
   24  SD 232.8    3.69     1.5     184
   25  K      1      3                                                      1
   26  K1       3 CHANNEL ROUTING  D/S OF DAM AT STN 35+00
   27  Y                                     1       1
   28  Y1     1
   29  Y6  0.04   0.035    0.04     165     190    3500   0.017
   30  Y7     0     190      80     180     100     170     105     165     115     168
   31  Y7   150     170     390     180     470     190
   32  K     99
```

Sheet 4 of 19

PREVIEW OF SEQUENCE OF STREAM NETWORK CALCULATIONS

RUNOFF HYDROGRAPH AT	1
ROUTE HYDROGRAPH TO	2
ROUTE HYDROGRAPH TO	3
END OF NETWORK	

****
FLOOD HYDROGRAPH PACKAGE (HEC-1)
DAM SAFETY VERSION JULY 1978
LAST MODIFICATION 01 APR 80
****

RUN DATE= 81/06/03.
TIME= 17.25.58.

BLIND BROOK DAM PHASE 1 INSPECTION
HEC-1DB PMF ANALYSIS
APRIL 1981 TAMS 1579-11

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
100	0	30	0	0	0	0	0	0	0

JOPER	NWT	IROPT	TRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 4 LRTIO= 1

RTIOS= 1.00 .75 .50 .25

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

1 BASIN RUNOFF

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
1	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
1	1	1.79	0.00	1.79	0.00	0.000	0	1	0

PRECIP DATA

SPFE	PMS	R6	R12	R24	R48	R72	R96
0.00	22.00	111.00	123.00	133.00	142.00	0.00	0.00

TRSPC COMPUTED BY THE PROGRAM IS .600

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
2	0.00	0.00	1.00	0.00	0.00	1.00	2.00	.17	0.00	.03

UNIT HYDROGRAPH DATA
TP= 2.69 CP= .68 NTA= 0

RECESSION DATA
STRTQ= -1.00 QRCSN= -.10 RTIOR= 1.50
APPROXIMATE CLARK COEFFICIENTS FROM GIVEN SNYDER CP AND TP ARE TC= 6.52 AND R= 4.07 INTERVALS

UNIT HYDROGRAPH 26 END-OF-PERIOD ORDINATES, LAG= 2.69 HOURS, CP= .65 VOL= 1.00

21.	75.	191.	224.	276.	297.	269.	218.	171.	133.
104.	81.	63.	50.	39.	30.	24.	19.	14.	11.

Sheet 6 of 19

	9.	7.	5.	4.	3.		3.						
						END-OF-PERIOD FLOW							
O	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
	1.01	.30	1	.00	.00	.00	2.	1.02	1.30	51	.06	.00	.06	1.
	1.01	1.00	2	.00	.00	.00	2.	1.02	2.00	52	.06	.00	.06	1.
	1.01	1.30	3	.00	.00	.00	2.	1.02	2.30	53	.06	.00	.06	2.
	1.01	2.01	4	.00	.00	.00	2.	1.02	3.00	54	.06	.00	.06	2.
	1.01	2.30	5	.00	.00	.00	2.	1.02	3.30	55	.06	.00	.06	2.
	1.01	3.00	6	.00	.00	.00	2.	1.02	4.00	56	.06	.00	.06	3.
	1.01	3.30	7	.00	.00	.00	1.	1.02	4.30	57	.06	.00	.06	3.
	1.01	4.00	8	.00	.00	.00	1.	1.02	5.00	58	.06	.00	.06	3.
	1.01	4.30	9	.00	.00	.00	1.	1.02	5.30	59	.06	.00	.06	3.
	1.01	5.00	10	.00	.00	.00	1.	1.02	6.00	60	.06	.00	.06	3.
	1.01	5.30	11	.00	.00	.00	1.	1.02	6.30	61	.18	.09	.09	5.
	1.01	6.00	12	.00	.00	.00	1.	1.02	7.00	62	.18	.09	.08	12.
	1.01	6.30	13	.01	.00	.01	1.	1.02	7.30	63	.18	.09	.09	26.
	1.01	7.00	14	.01	.00	.01	1.	1.02	8.00	64	.18	.09	.08	47.
	1.01	7.30	15	.01	.00	.01	1.	1.02	8.30	65	.18	.09	.08	72.
	1.01	8.00	16	.01	.00	.01	1.	1.02	9.00	66	.18	.09	.08	99.
	1.01	8.30	17	.01	.00	.01	1.	1.02	9.30	67	.18	.09	.08	124.
	1.01	9.00	18	.01	.00	.01	1.	1.02	10.00	68	.18	.09	.08	144.
	1.01	9.30	19	.01	.00	.01	1.	1.02	10.30	69	.18	.09	.08	159.
	1.01	10.00	20	.01	.00	.01	1.	1.02	11.00	70	.18	.09	.08	172.
	1.01	10.30	21	.01	.00	.01	1.	1.02	11.30	71	.18	.09	.08	181.
	1.01	11.00	22	.01	.00	.01	1.	1.02	12.00	72	.18	.09	.08	189.
	1.01	11.30	23	.01	.00	.01	1.	1.02	12.30	73	.98	.89	.08	212.
	1.01	12.00	24	.01	.00	.01	1.	1.02	13.00	74	.98	.89	.08	279.
	1.01	12.30	25	.07	.00	.06	1.	1.02	13.30	75	1.17	1.09	.08	407.
	1.01	13.00	26	.07	.00	.06	1.	1.02	14.00	76	1.17	1.09	.08	604.
	1.01	13.30	27	.09	.00	.09	2.	1.02	14.30	77	1.47	1.38	.08	862.
	1.01	14.00	28	.09	.00	.09	2.	1.02	15.00	78	1.47	1.38	.08	1165.
	1.01	14.30	29	.10	.00	.10	2.	1.02	15.30	79	1.78	1.70	.08	1487.
	1.01	15.00	30	.10	.00	.10	3.	1.02	16.00	80	5.64	5.56	.08	1893.
	1.01	15.30	31	.12	.00	.12	3.	1.02	16.30	81	1.37	1.28	.08	2419.
	1.01	16.00	32	.38	.01	.37	4.	1.02	17.00	82	1.37	1.28	.08	2976.
	1.01	16.30	33	.09	.00	.09	5.	1.02	17.30	83	1.07	.99	.08	3473.
	1.01	17.00	34	.09	.00	.09	6.	1.02	18.00	84	1.07	.99	.08	3807.
	1.01	17.30	35	.07	.00	.07	7.	1.02	18.30	85	.09	.01	.08	3901.
	1.01	18.00	36	.07	.00	.07	7.	1.02	19.00	86	.09	.01	.08	3709.
	1.01	18.30	37	.01	.00	.01	7.	1.02	19.30	87	.09	.01	.08	3299.
	1.01	19.00	38	.01	.00	.01	7.	1.02	20.00	88	.09	.01	.08	2817.
	1.01	19.30	39	.01	.00	.01	6.	1.02	20.30	89	.09	.01	.08	2350.
	1.01	20.00	40	.01	.00	.01	5.	1.02	21.00	90	.09	.01	.08	1970.
	1.01	20.30	41	.01	.00	.01	5.	1.02	21.30	91	.09	.01	.08	1671.
	1.01	21.00	42	.01	.00	.01	4.	1.02	22.00	92	.09	.01	.08	1151.
	1.01	21.30	43	.01	.00	.01	3.	1.02	22.30	93	.09	.01	.08	902.
	1.01	22.00	44	.01	.00	.01	3.	1.02	23.00	94	.09	.01	.08	707.
	1.01	22.30	45	.01	.00	.01	2.	1.02	23.30	95	.09	.01	.08	555.
	1.01	23.00	46	.01	.00	.01	2.	1.03	0.00	96	.09	.01	.08	436.
	1.01	23.30	47	.01	.00	.01	2.	1.03	.30	97	0.00	0.00	0.00	342.
	1.02	0.00	48	.01	.00	.01	1.	1.03	1.00	98	0.00	0.00	0.00	267.
	1.02	.30	49	.00	.00	.00	1.	1.03	1.30	99	0.00	0.00	0.00	252.
	1.02	1.00	50	.00	.00	.00	1.	1.03	2.00	100	0.00	0.00	0.00	239.
										SUM	24.99	19.78	5.21	45545.
											(635.)	(502.)	(132.)	(1289.69)

PEAK 6-HOUR 24-HOUR 72-HOUR TOTAL VOLUME

CFS	3901.	2831.	943.	454.	45379.
CMS	110.	80.	27.	13.	1285.
INCHES		14.71	19.60	19.65	19.65
MM		373.70	497.77	499.17	499.17
AC-FT		1404.	1870.	1875.	1875.
THOUS CU M		1732.	2307.	2313.	2313.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 1

2.	2.	2.	2.	2.	2.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	2.	2.	2.	3.
3.	4.	5.	6.	7.	7.	7.	7.	6.	5.
5.	4.	3.	3.	2.	2.	2.	1.	1.	1.
1.	1.	2.	2.	2.	3.	3.	3.	3.	3.
5.	12.	26.	47.	72.	99.	124.	144.	159.	172.
181.	189.	212.	278.	407.	604.	862.	1165.	1487.	1893.
2419.	2976.	3473.	3907.	3901.	3709.	3299.	2817.	2330.	1870.
1471.	1151.	902.	707.	555.	436.	342.	367.	352.	339.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3901.	2831.	943.	454.	45379.
CMS	110.	80.	27.	13.	1285.
INCHES		14.71	19.60	19.65	19.65
MM		373.70	497.77	499.17	499.17
AC-FT		1404.	1870.	1875.	1875.
THOUS CU M		1732.	2307.	2313.	2313.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 2

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
3.	3.	4.	4.	5.	5.	5.	5.	5.	4.
3.	3.	2.	2.	2.	1.	1.	1.	1.	1.
1.	1.	1.	2.	2.	2.	2.	2.	2.	2.
4.	9.	20.	35.	54.	74.	98.	108.	119.	129.
136.	141.	159.	209.	305.	453.	647.	874.	1115.	1420.
1814.	2232.	2605.	2855.	2926.	2782.	2474.	2113.	1747.	1402.
1103.	864.	676.	530.	416.	327.	257.	275.	264.	254.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2926.	2123.	707.	340.	34034.
CMS	83.	60.	20.	10.	964.
INCHES		11.03	14.70	14.74	14.74
MM		280.25	373.33	374.37	374.37
AC-FT		1053.	1402.	1406.	1406.
THOUS CU M		1299.	1730.	1735.	1735.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 3

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
2.	2.	2.	3.	3.	4.	4.	3.	3.	3.
2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.

3.	6.	13.	23.	36.	49.	62.	77.	80.	86.
91.	94.	105.	139.	203.	302.	431.	583.	764.	947.
1210.	1458.	1737.	1908.	1950.	1854.	1650.	1402.	1165.	935.
735.	575.	451.	353.	277.	218.	191.	183.	176.	169.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1950.	1416.	471.	227.	22689.
CMS	55.	40.	13.	6.	642.
INCHES		7.36	9.80	9.82	9.82
MM		186.85	248.89	249.58	249.58
AC-FT		732.	935.	935.	935.
THOUS CU M		846.	1153.	1156.	1156.

HYDROGRAPH AT STA 1 FOR PLAN 1, RTIO 4

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
1.	1.	1.	1.	2.	2.	2.	2.	2.	1.
1.	1.	1.	1.	1.	0.	0.	0.	0.	0.
0.	0.	0.	1.	1.	1.	1.	1.	1.	1.
1.	3.	7.	12.	18.	25.	31.	36.	40.	43.
45.	47.	53.	70.	102.	151.	216.	291.	372.	473.
605.	744.	856.	952.	975.	927.	825.	704.	582.	467.
368.	288.	225.	177.	139.	109.	96.	92.	88.	85.

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	975.	708.	236.	113.	11345.
CMS	28.	20.	7.	3.	321.
INCHES		3.68	4.90	4.91	4.91
MM		93.43	124.44	124.79	124.79
AC-FT		351.	467.	469.	469.
THOUS CU M		433.	577.	579.	578.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

2 RESERVOIR ROUTING

ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
2	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	26.	-1

STAGE	230.00	232.33	232.45	242.00
FLOW	0.00	535.00	673.00	1650.00
CAPACITY=		26.	50.	66.

Sheet 9 of 19

ELEVATION= 2310. 2322. 2330.

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

DAM DATA

TOPEL	COQD	EXPD	DAMWID
[illegible]	[illegible]	[illegible]	[illegible]

STATION [illegible], PLAN [illegible], RATIO [illegible]

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	2.	2.	2.	2.	2.	2.	0.	0.	0.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	2.	2.	2.
3.	4.	4.	5.	6.	7.	7.	7.	7.	6.
5.	4.	4.	3.	2.	2.	2.	1.	1.	1.
1.	1.	2.	2.	2.	2.	3.	3.	3.	3.
4.	3.	17.	32.	54.	79.	10[illegible].	128.	146.	161.
173.	182.	195.	235.	320.	466.	[illegible].	1264.	1382.	1974.
2326.	3046.	3393.	3273.	3536.	3776.	3248.	2880.	2287.	1926.
1435.	1193.	874.	745.	630.	553.	446.	390.	366.	350.

STORAGE

26.	25.	25.	25.	25.	26.	26.	26.	26.	26.
26.	26.	26.	25.	25.	26.	26.	26.	26.	26.
26.	25.	25.	25.	26.	26.	26.	26.	26.	26.
26.	26.	25.	25.	26.	26.	26.	26.	25.	26.
26.	26.	25.	26.	26.	26.	26.	26.	26.	26.
26.	26.	26.	25.	26.	26.	26.	26.	26.	26.
26.	26.	27.	27.	2[illegible].	2[illegible].	29.	30.	31.	31.
31.	32.	32.	33.	36.	41.	49.	51.	51.	51.
52.	52.	52.	55.	53.	53.	52.	52.	52.	51.
51.	51.	50.	50.	48.	44.	40.	38.	38.	37.

STAGE

230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.1	230.1	230.2	230.3	230.4	230.5	230.5	230.6
230.6	230.7	230.7	230.9	231.2	231.7	232.5	233.7	233.8	234.4
234.7	235.2	235.4	235.[illegible]	235.7	235.7	235.3	235.1	234.6	234.3
233.9	233.6	233.2	233.0	232.6	232.1	231.7	231.5	231.4	231.3

PEAK OUTFLOW IS 3873. AT TIME 42.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3873.	2231.	937.	451.	45112.
CMS	110.	[illegible].	27.	13.	1277.
INCHES		14.71	19.48	19.54	19.54
MM		373.69	494.63	496.27	496.27
AC-FT		1404.	1859.	1864.	1864.
THOUS CU M		1732.	2293.	2299.	2299.

Sheet 10 of 14

STATION 2, PLAN 1, RATIO 2

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	2.	2.
2.	3.	3.	4.	4.	5.	5.	5.	5.	5.
4.	3.	3.	2.	2.	2.	1.	1.	1.	1.
1.	1.	1.	1.	2.	2.	2.	2.	2.	2.
3.	5.	13.	24.	40.	59.	78.	96.	110.	121.
130.	137.	147.	176.	240.	350.	508.	661.	1259.	1276.
1930.	2107.	2737.	2751.	3021.	2697.	2554.	2042.	1826.	1344.
1170.	614.	730.	618.	535.	406.	327.	291.	274.	262.

STORAGE

26.	26.	26.	26.	26.	26.	26.	26.	26.	26.
26.	25.	25.	25.	26.	25.	26.	26.	26.	26.
26.	26.	26.	26.	26.	26.	25.	25.	26.	26.
26.	26.	26.	26.	26.	26.	26.	26.	26.	26.
26.	26.	26.	26.	26.	26.	26.	26.	26.	26.
26.	26.	26.	26.	26.	26.	26.	26.	26.	26.
25.	25.	25.	27.	27.	28.	29.	29.	29.	30.
30.	30.	31.	32.	34.	37.	42.	49.	51.	51.
51.	52.	52.	52.	52.	52.	52.	52.	51.	51.
51.	50.	50.	47.	43.	39.	36.	35.	35.	34.

STAGE

230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.1	230.0	230.1	230.2	230.2	230.3	230.4	230.4	230.5
230.5	230.5	230.6	230.7	230.9	231.3	231.9	232.8	233.7	233.7
234.3	234.5	235.0	235.0	235.2	235.0	234.9	234.4	234.3	233.8
233.6	233.1	233.0	232.5	232.0	231.5	231.2	231.1	231.0	231.0

PEAK OUTFLOW IS 3021. AT TIME 42.50 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3021.	2123.	703.	335.	33833.
CMS	86.	60.	20.	10.	958.
INCHES		11.04	14.61	14.65	14.65
MM		280.30	371.12	372.17	372.17
AC-FT		1053.	1394.	1398.	1398.
THOUS CU M		1299.	1720.	1725.	1725.

STATION 2, PLAN 1, RATIO 3

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

Sheet 11 of 19

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	2.	2.	3.	3.	3.	4.	4.	3.	3.
3.	2.	2.	2.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	2.
2.	4.	8.	16.	27.	39.	52.	64.	73.	81.
87.	91.	98.	117.	160.	233.	338.	471.	599.	890.
1246.	1441.	1769.	1867.	1982.	1829.	1691.	1390.	1193.	922.
761.	640.	557.	449.	344.	269.	218.	194.	183.	175.

STORAGE

26.	25.	26.	26.	26.	26.	26.	26.	26.	26.
26.	25.	26.	26.	26.	26.	26.	26.	26.	26.
26.	25.	25.	25.	26.	26.	26.	26.	26.	26.
26.	25.	25.	25.	26.	26.	26.	26.	26.	26.
26.	26.	25.	25.	26.	26.	26.	26.	26.	26.
26.	26.	26.	26.	26.	26.	26.	26.	26.	26.
26.	26.	26.	27.	27.	27.	29.	28.	28.	29.
29.	29.	29.	30.	31.	33.	37.	41.	46.	50.
51.	51.	51.	51.	51.	51.	51.	51.	51.	50.
50.	48.	45.	40.	37.	34.	33.	32.	32.	32.

STAGE

230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.1	230.1	230.1	230.2	230.2	230.3	230.3
230.3	230.3	230.4	230.4	230.6	230.9	231.3	231.8	232.4	233.3
233.7	233.9	234.2	234.3	234.4	234.3	234.1	233.8	233.6	233.3
233.0	232.6	232.2	231.7	231.3	231.0	230.8	230.7	230.7	230.7

PEAK OUTFLOW IS 1982. AT TIME 42.50 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1982.	1409.	469.	226.	22556.
CMS	56.	40.	13.	6.	639.
INCHES		7.31	9.74	9.77	9.77
MM		185.79	247.42	248.11	248.11
AC-FT		698.	929.	932.	932.
THOUS CU M		861.	1146.	1150.	1150.

STATION 2, PLAN 1, RATIO 4

END-OF-PERIOD HYDROGRAPH ORDINATES

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
1.	1.	1.	1.	1.	2.	2.	2.	2.	2.
1.	1.	1.	1.	1.	1.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	1.
1.	2.	4.	8.	13.	20.	26.	32.	37.	40.

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43.	46.	49.	59.	80.	117.	149.	236.	311.	399.
510.	611.	874.	977.	952.	951.	911.	776.	643.	575.
465.	357.	278.	217.	170.	134.	109.	97.	91.	87.

STORAGE

26.	26.	26.	26.	26.	26.	26.	26.	26.	26.
26.	26.	25.	26.	26.	26.	26.	26.	26.	26.
26.	26.	26.	26.	26.	26.	26.	26.	26.	26.
25.	25.	25.	26.	26.	26.	26.	26.	26.	26.
26.	25.	25.	26.	26.	25.	26.	26.	26.	26.
25.	25.	25.	25.	26.	26.	26.	26.	26.	26.
26.	26.	26.	26.	26.	27.	27.	27.	27.	27.
27.	27.	28.	29.	29.	30.	31.	33.	36.	39.
42.	47.	50.	51.	50.	50.	50.	50.	48.	45.
41.	37.	35.	33.	31.	30.	29.	29.	29.	29.

STAGE

230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0	230.0
230.0	230.0	230.0	230.0	230.1	230.1	230.1	230.1	230.1	230.2
230.2	230.2	230.2	230.2	230.3	230.4	230.6	230.9	231.2	231.5
231.9	232.5	233.2	233.4	233.3	233.3	233.1	233.0	232.6	232.2
231.7	231.3	231.0	230.8	230.6	230.5	230.4	230.4	230.3	230.3

PEAK OUTFLOW IS 977. AT TIME 42.00 HOURS

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	977.	703.	234.	113.	11279.
CMS	28.	20.	7.	3.	319.
INCHES		3.65	4.87	4.88	4.88
MM		92.75	123.72	124.07	124.07
AC-FT		348.	465.	466.	466.
THOUS CU M		430.	573.	575.	575.

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

3 CHANNEL ROUTING D/S OF DAM AT STN 35+00

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
3	1	0	0	0	0	1	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	0.	0

Sheet 13 of 19

NORMAL DEPTH CHANNEL ROUTING

QN(1)	QN(2)	QN(3)	ELNVT	ELMAX	RLNTH	SEL
.0400	.0350	.0400	165.0	190.0	3500.	.01700

CROSS SECTION COORDINATES--STA,ELEV,STA,ELEV--ETC

0.00 190.00 80.00 180.00 100.00 170.00 105.00 165.00 115.00 168.00
150.00 170.00 390.00 180.00 470.00 190.00

STORAGE	0.00	.33	1.21	3.22	7.76	15.58	27.01	42.06	60.73	83.02
	108.92	138.44	171.32	206.54	243.99	283.67	325.57	369.69	416.04	464.62
OUTFLOW	0.00	14.52	92.21	255.57	792.52	2027.05	4019.88	6940.88	10940.57	16158.16
	22724.68	30764.75	40835.58	52912.15	66687.19	82168.49	99382.91	118365.62	139156.14	161796.44
STAGE	165.00	166.32	167.63	168.95	170.26	171.58	172.89	174.21	175.53	176.84
	178.16	179.47	180.79	182.11	183.42	184.74	186.05	187.37	188.68	190.00
FLOW	0.00	14.52	92.21	255.57	792.52	2027.05	4019.88	6940.88	10940.57	16158.16
	22724.68	30764.75	40835.58	52912.15	66687.19	82168.49	99382.91	118365.62	139156.14	161796.44

STATION 3, PLAN 1, RTIO 1

OUTFLOW

1.	1.	2.	2.	2.	2.	2.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	2.	2.	2.
3.	3.	4.	5.	6.	6.	7.	7.	7.	6.
6.	5.	4.	3.	3.	3.	2.	2.	1.	1.
1.	1.	1.	2.	2.	2.	3.	3.	3.	3.
4.	6.	12.	27.	47.	72.	97.	121.	141.	157.
170.	180.	192.	221.	296.	434.	602.	1122.	1430.	1809.
2327.	2983.	3409.	3759.	3908.	3749.	3373.	2886.	2413.	1936.
1545.	1196.	952.	739.	666.	569.	474.	394.	371.	352.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	2.	2.	2.
2.	2.	2.	3.	4.	5.	6.	10.	12.	14.
17.	20.	24.	26.	26.	25.	22.	21.	18.	15.
13.	10.	9.	7.	7.	6.	5.	4.	4.	4.

STAGE

165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1
165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1
165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.2	165.2	165.2
165.2	165.3	165.4	165.4	165.5	165.6	165.6	165.6	165.6	165.6
165.5	165.4	165.4	165.3	165.2	165.2	165.2	165.1	165.1	165.1
165.1	165.1	165.1	165.2	165.2	165.2	165.2	165.2	165.3	165.3
165.3	165.5	166.1	166.5	166.9	167.3	167.7	167.9	168.0	168.2
168.3	168.3	168.4	168.7	169.0	169.4	169.8	170.6	170.9	171.3

171.8	172.1	172.5	172.7	172.8	172.7	172.5	172.1	171.8	171.5
171.1	170.7	170.4	170.1	170.0	169.7	169.5	169.3	169.2	169.2

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	3908.	2930.	935.	450.	45015.
CMS	111.	80.	26.	13.	1275.
INCHES		14.70	19.44	19.49	19.49
MM		373.50	493.77	495.16	495.16
AC-FT		1483.	1955.	1960.	1960.
THOUS CU M		1731.	2288.	2294.	2294.

MAXIMUM STORAGE = 26.

MAXIMUM STAGE IS 172.8

STATION 2, PLAN 1, RTIO 2

OUTFLOW

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	2.
2.	2.	3.	4.	4.	5.	5.	5.	5.	5.
4.	4.	3.	3.	2.	2.	1.	1.	1.	1.
1.	1.	1.	1.	1.	2.	2.	2.	2.	2.
3.	4.	9.	20.	36.	54.	73.	91.	106.	118.
127.	135.	144.	166.	218.	322.	473.	631.	1122.	1344.
1740.	2171.	2542.	2835.	2915.	2827.	2519.	2181.	1800.	1471.
1143.	915.	706.	661.	541.	440.	335.	298.	276.	265.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	1.	1.	1.	1.	1.	2.
2.	2.	2.	2.	3.	4.	5.	6.	10.	11.
14.	15.	13.	20.	21.	20.	18.	16.	14.	12.
10.	9.	7.	7.	6.	5.	4.	4.	3.	3.

STAGE

165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1
165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1
165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.2
165.2	165.2	165.3	165.3	165.4	165.4	165.5	165.5	165.5	165.4
165.4	165.3	165.3	165.2	165.2	165.2	165.1	165.1	165.1	165.1
165.1	165.1	165.1	165.1	165.1	165.2	165.2	165.2	165.2	165.2
165.2	165.4	165.6	166.4	166.7	167.0	167.3	167.6	167.7	167.8
167.9	168.0	168.0	168.2	168.6	169.1	169.5	169.9	170.6	170.9
171.3	171.7	171.9	172.1	172.2	172.1	171.9	171.7	171.3	171.0
170.6	170.4	170.1	170.0	169.8	169.6	169.4	169.2	169.0	169.0

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	2915.	2123.	701.	339.	33754.
CMS	83.	60.	20.	10.	956.
INCHES		11.03	14.58	14.62	14.62

MM	280.26	370.24	371.29	371.29	
AC-FT	1053.	1391.	1395.	1395.	
THOUS CU M	1299.	1716.	1720.	1720.	

MAXIMUM STORAGE = 21.

MAXIMUM STAGE IS 172.2

STATION 3, PLAN 1, RTIO 3

OUTFLOW

1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	2.	2.	2.	3.	3.	3.	4.	3.	3.
3.	2.	2.	2.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	2.
2.	3.	6.	12.	23.	36.	49.	61.	71.	79.
85.	90.	96.	111.	146.	201.	312.	444.	574.	818.
1201.	1420.	1704.	1879.	1949.	1882.	1687.	1455.	1205.	980.
770.	671.	575.	489.	361.	282.	230.	200.	185.	177.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	1.	1.	1.	1.	1.
1.	1.	1.	1.	2.	3.	4.	5.	6.	8.
10.	12.	14.	15.	15.	15.	13.	12.	10.	9.
8.	7.	6.	5.	4.	3.	3.	3.	2.	2.

STAGE

165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1
165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1
165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1
165.1	165.1	165.2	165.2	165.3	165.3	165.3	165.3	165.3	165.3
165.3	165.2	165.2	165.2	165.1	165.1	165.1	165.1	165.1	165.1
165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1	165.1
165.2	165.3	165.6	166.1	166.5	166.7	166.9	167.1	167.3	167.4
167.5	167.6	167.7	167.7	167.1	169.6	169.1	169.4	169.7	170.3
170.7	170.9	171.2	171.4	171.5	171.4	171.2	171.0	170.7	170.5
170.2	170.0	169.7	169.5	169.2	169.0	168.7	168.5	168.4	168.3

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	1949.	1406.	467.	225.	22502.
CMS	55.	40.	13.	6.	637.
INCHES		7.31	9.72	9.74	9.74
MM		185.62	246.82	247.52	247.52
AC-FT		697.	927.	930.	930.
THOUS CU M		860.	1144.	1147.	1147.

MAXIMUM STORAGE = 15.

Sheet 16 of 19

MAXIMUM STAGE IS 171.5

STATION 3, PLAN 1, RTIO 4

OUTFLOW

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
0.	0.	0.	0.	1.	2.	2.	2.	2.	2.
1.	1.	1.	1.	1.	1.	2.	0.	0.	0.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
0.	0.	0.	0.	0.	1.	1.	1.	1.	1.
1.	1.	3.	6.	11.	17.	25.	30.	35.	39.
43.	45.	48.	56.	73.	105.	152.	215.	293.	381.
485.	592.	777.	972.	961.	947.	846.	732.	664.	595.
493.	377.	292.	232.	184.	144.	116.	100.	93.	88.

STOR

0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
1.	1.	1.	1.	1.	1.	2.	3.	4.	4.
5.	4.	4.	3.	2.	2.	1.	1.	1.	1.
5.	4.	4.	3.	2.	2.	1.	1.	1.	1.

STAGE

165.0	165.0	165.0	165.0	165.0	165.0	165.0	165.0	165.0	165.0
165.0	165.0	165.0	165.0	165.0	165.0	165.0	165.0	165.0	165.0
165.0	165.0	165.0	165.0	165.0	165.0	165.0	165.0	165.0	165.1
165.1	165.1	165.1	165.1	165.1	165.1	165.2	165.2	165.2	165.1
165.1	165.1	165.1	165.1	165.1	165.1	165.0	165.0	165.0	165.0
165.0	165.0	165.0	165.0	165.0	165.1	165.1	165.1	165.1	165.1
165.1	165.1	165.3	165.6	166.0	166.4	166.5	166.6	166.7	166.7
166.8	166.8	166.9	167.0	167.3	167.7	168.1	168.6	169.3	169.3
169.5	169.8	170.2	170.5	170.4	170.4	170.3	170.1	169.9	169.8
169.5	169.2	169.0	168.8	168.4	168.0	167.8	167.7	167.6	167.6

	PEAK	6-HOUR	24-HOUR	72-HOUR	TOTAL VOLUME
CFS	972.	703.	234.	113.	11251.
CMS	25.	20.	7.	3.	319.
INCHES		3.65	4.86	4.87	4.87
MM		92.76	123.41	123.76	123.76
AC-FT		349.	464.	465.	465.
THOUS CU M		430.	572.	573.	573.

MAXIMUM STORAGE = 9.

MAXIMUM STAGE IS 170.5

Sheet 17 of 19

********** ********** ********** ********** **********

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 1.00	RATIO 2 .75	RATIO 3 .50	RATIO 4 .25
HYDROGRAPH AT	1	1.79	1	7901.	2926.	1950.	975.
		(4.64)		(110.45)(	82.85)(	55.23)(	27.62)(
ROUTED TO	2	1.79	1	3873.	3021.	1992.	977.
		(4.64)		(109.66)(	85.53)(	56.13)(	27.65)(
ROUTED TO	3	1.79	1	3906.	2915.	1940.	972.
		(4.64)		(110.67)(	82.53)(	55.19)(	27.52)(

SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	230.00	230.00	232.80
STORAGE	26.	26.	50.
OUTFLOW	0.	0.	668.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	235.76	2.96	53.	3873.	8.50	42.00	0.00
.75	235.19	2.39	52.	3021.	7.50	42.50	0.00
.50	234.39	1.59	51.	1992.	6.00	42.50	0.00
.25	233.37	.57	51.	977.	3.00	42.00	0.00

PLAN 1 STATION 3

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
1.00	3908.	172.8	42.50
.75	2915.	172.2	42.50
.50	1949.	171.5	42.50
.25	972.	170.5	42.00

STABILITY ANALYSIS

APPENDIX E

TAMS

Job No. 1579-11 Sheet 1 of 11
Project Blind Brook Country Club-Phase I Inspection Date April 29, 1981
Subject Stability Analysis. By G.P.M.
Ch'k. by

Loading Conditions

Case	Description
I	Normal Loading - Lake level at Overflow Section Crest Elevation (EL. 108)*
II	Normal Loading as in Case I with an additional Ice Loading of 5 kips/L.F. at 5' below Crest.
III	Unusual Loading - Lake level at ½ PMF (EL. 112.42)*
IV	Extreme Loading - Lake level at full PMF (EL. 113.79)*

* Elevations are as shown on drawings i.e EL 108 = 230. (MSL)

Stability and Overturning Criteria (Recommended guidelines Ref. 3)

Case	Location of Resultant	Friction Factor of Safety
I	middle third	> 3.0
II	middle third	> 3.0
III	middle third	> 3.0
IV	middle third	> 3.0

Assumptions

1. The configuration of the Spillway Section is as shown on Plate 2
2. The dam is assumed to be founded on rock. The shearing resistance between the rock and spillway concrete base is a c = 1.1 and $\phi = 40°$

TAMS

Job No. 1579-11 Sheet 2 of 11
Project Blind Brook Country Club - Phase I Irrigation Date 4/29/91
Subject Stability Analysis By G.P.M.
Ch'k. by JP

Computation of Center of Gravity (See Figure 1)

A. Dead Loads

	Fv. (kips)		M_A (kF)	
W_1 =	.150 × 3 × 32 = 14.4	×	20.50 =	295.2 ←
W_2 =	.150 × 32/2 × 18 = 43.2	×	13 =	561.6
W_3 =	.150 × (1+6.5)/2 × 5 = 2.8	×	0.50 =	1.4

ΣF_v = 14.4 + 43.2 + 2.8 = 60.4K, ΣM_A = 295.2 + 561.6 + 1.4 = 858.2

$$\bar{x} = \frac{\Sigma M_A}{\Sigma F_v} = \frac{858.2}{60.4} = 14.2'$$

$$\bar{y} = \frac{14.4 \times \frac{32}{2} + 43.2 \times \frac{(32-1)}{3} + 2.8 \times 3.13}{W_1 + W_2 + W_3} = \frac{685.56}{14.4+43.2+2.8}$$

$= 11.35'$ say $11.4'$

TAMS

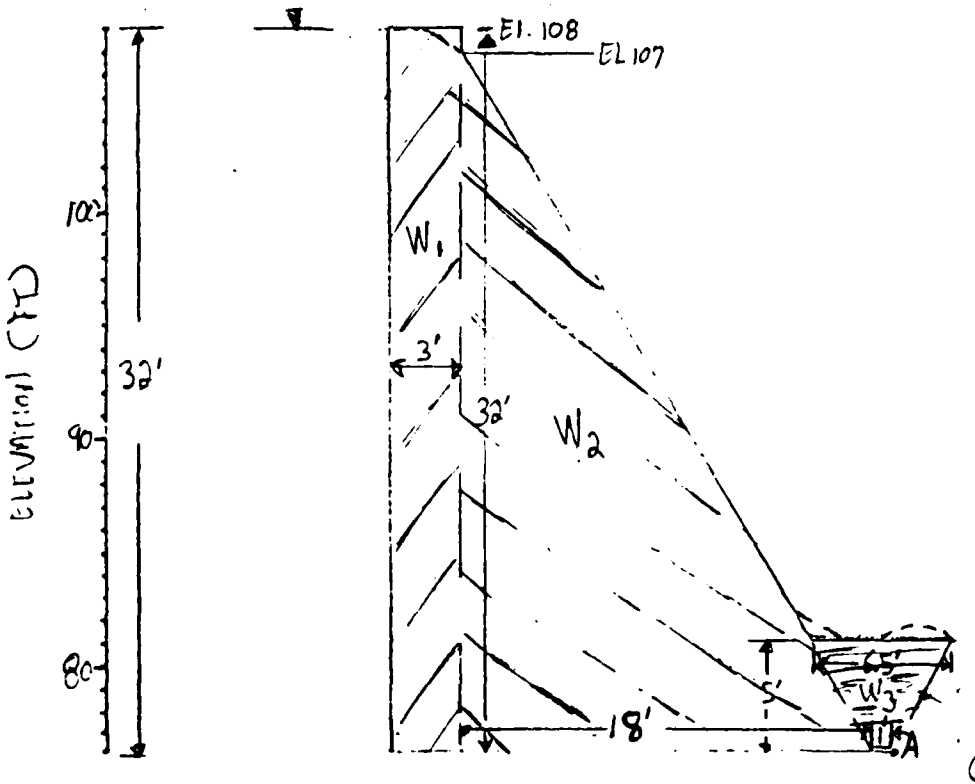
Job No. 1579-11 Sheet 3 of 11

Project Blind Brook Country Club: Phase I Inspection Date 4/29/81

Subject Stability Analysis By G.P.M.

Ch'k. by JP

Computation of Center of Gravity



C.G. of W_3 , $W_3 = 2.8$

$\bar{y} = \frac{(2 \times \frac{1}{2} \times .75 \times 5 \times (5 - \frac{5}{3}) + 5 \times 1 \times 2.5) .15}{W_3}$

$= 3.13$

$\bar{x}$ @ ℄ = .5' from Pt. A

Scale 1/8" = 1ft.

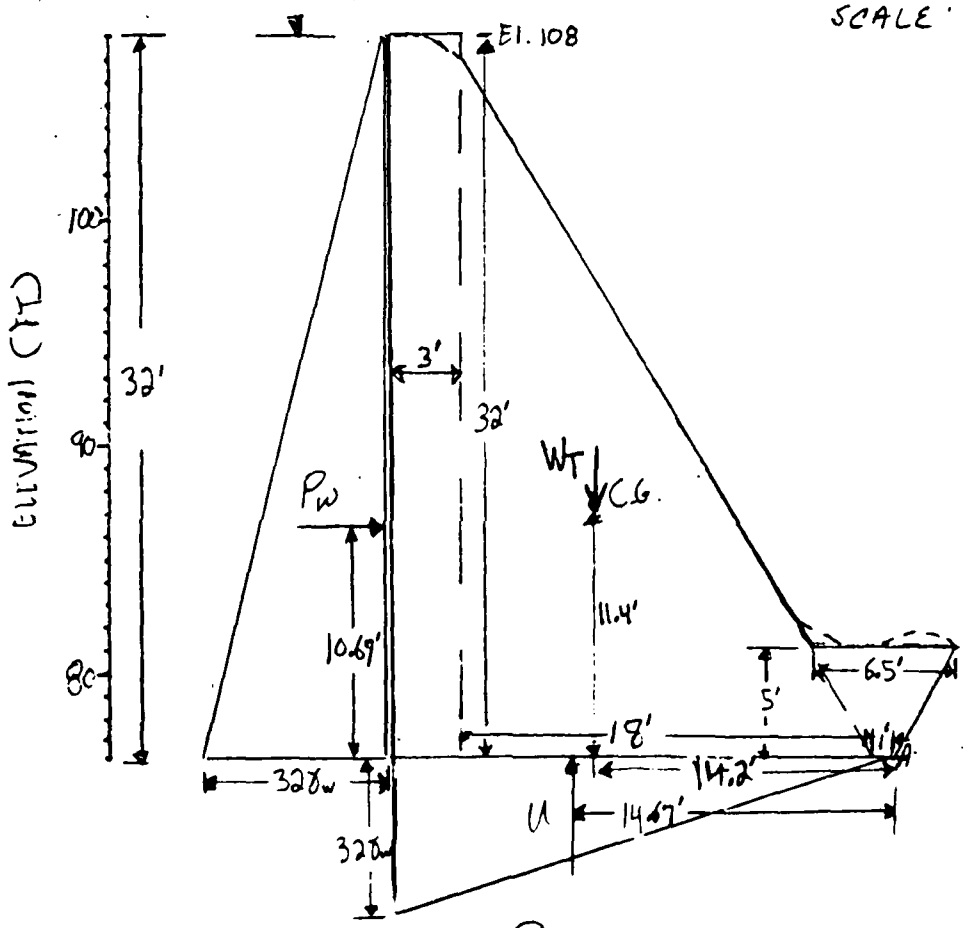
Figure 1

TAMS

Job No. 1579-11 Sheet 4 of 11
Project Blind Brook Country Club: Phase I Inspection Date 4/29/81
Subject Stability Analysis By G.P.M.
Ch'k. by JP

Case I: Normal Loading Condition (Lake Level @ Spillway Crest)

SCALE: 1/8" = 1ft.



$P_W = \frac{1}{2} \times 32 \times 32\gamma_w = 512\gamma_w \rightarrow$ $\quad P_{WA} = 512\gamma_w \times 10.67' = 5463\gamma_w \curvearrowright$

$U = \frac{1}{2} \times 22 \times 32\gamma_w = 352\gamma_w \uparrow$ $\quad U_A = 352\gamma_w \times 14.67' = 5163\gamma_w \curvearrowright$

Scale 1/8" = 1ft.

$W_T = 60.4K \times \frac{\gamma_w}{.0624K} = 968\gamma_w \downarrow$ $\quad W_{TA} = 968\gamma_w \times 14.2 = 13746\gamma_w \curvearrowleft$

Figure 2

TAMS

Job No. 1579-11 Sheet 5 of 11
Project Blind Brook Country Club - Phase I Inspection Date 4/24/91
Subject Stability Analysis By G.P.M.
Ch'k. by JP

CASE 1 Normal Loading Condition (Lake Level @ Spillway Crest)
- SEE Figure 2.

$\Sigma F_H = 512\gamma_w \rightarrow$ (K/LF)

$\Sigma F_V = W_T - U = 968\gamma_w - 352\gamma_w = 616\gamma_w \downarrow$ (K/LF)

$\Sigma M_{resisting} = W_{TA} = 13746\gamma_w$ (K-FT/LF).

$\Sigma M_{driving} = P_{WA} + U_A = 5463\gamma_w + 5163\gamma_w = 10626\gamma_w$ (K-FT/LF)

Location of Resultant @ Base

$\bar{x}_{result.} = \frac{\Sigma(M_r - M_d)}{\Sigma F_V} = \frac{13746\gamma_w - 10626\gamma_w}{616\gamma_w} = 5.06$ From pt. A.

x_{result} should fall betw. $\frac{22}{3} = 7.33'$ and $22 \cdot \frac{2}{3} = 14.67'$

x_{result} @ 2.27' outside middle Third

∴ No Good.

Shear Friction Factor of Safety

$S.F.F.S. = \frac{\Sigma F_V \tan\phi_b}{\Sigma F_H} = \frac{616\gamma_w \tan 40^\circ + 21(1)}{512\gamma_w}$

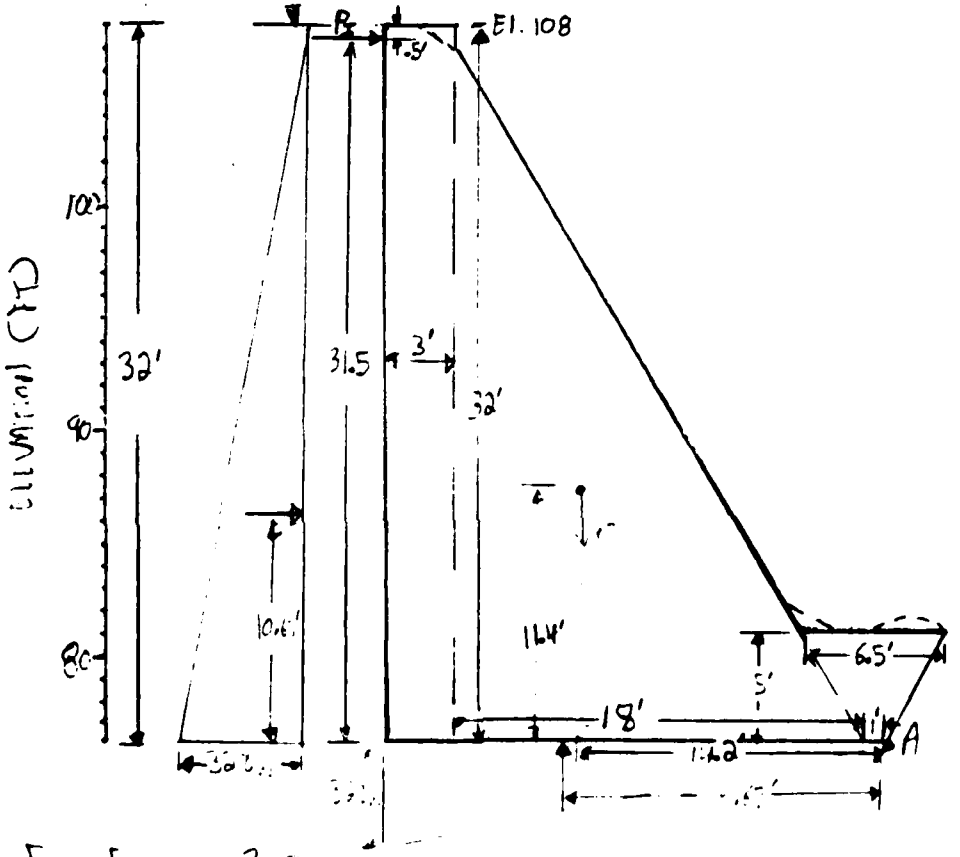
$S.F.F.S. = 1.66 < 3.0$ -

TAMS

Job No. 1579-11 Sheet 6 of 11
Project Blind Brook Country Club: Phase I Inspection Date 4/30/81
Subject Stability Analysis By G.P.M.
Ch'k. by P

Case II : Normal Loading with Ice Load

Ice Thickness = 1 ft
Ice Pressure = 5000 lbs/LF = 80.1



From Figure a, Pg. 3

$P_{WA} = 546.3\gamma_w$, $M_A = 516.2\gamma_w$, $M_{TA} = 3746\gamma_w$

$\Sigma F_H = 512.2\gamma_w$ (Pg. 4) + $P_I = 512.2\gamma_w + 80.1\gamma_w = 592.1\gamma_w \rightarrow$ (K/LF)

$\Sigma F_V = 616\gamma_w \rightarrow$ (K/LF) (Pg. 4)

$M_{IA} = 80.1\gamma_w \times 1.5 = 120.2\gamma_w$

$\Sigma M_A = \Sigma M_{TA} = 3746\gamma_w$ (K-FT/LF) (Pg. 4)

$\Sigma M_{(\ )} = \Sigma M_A = 10626\gamma_w$ (Pg. 4) + $M_{IA} = 10626\gamma_w + 2523\gamma_w = 13149\gamma_w$ (K-FT/LF)

Scale 1/8" = 1 ft.

Figure 3

TAMS

Job No. 1579-11 Sheet 7 of 11
Project Blind Brook Country Club - Phase I Inspection Date 4/30/81
Subject Stability Analysis By G.P.M.
Ch'k. by JP

CASE II : Normal Loading with Ice Load

$$\bar{X}_{res} = \frac{\Sigma(M_r - M_d)}{\Sigma F_v} = \frac{(13746 - 13149)\gamma_w}{616\,\gamma_w} = .97' \text{ from T.A.}$$

7.33' - .97 = 6.36 ft Outside Middle third of.
∴ No Good!

Shear Friction Factor of Safety

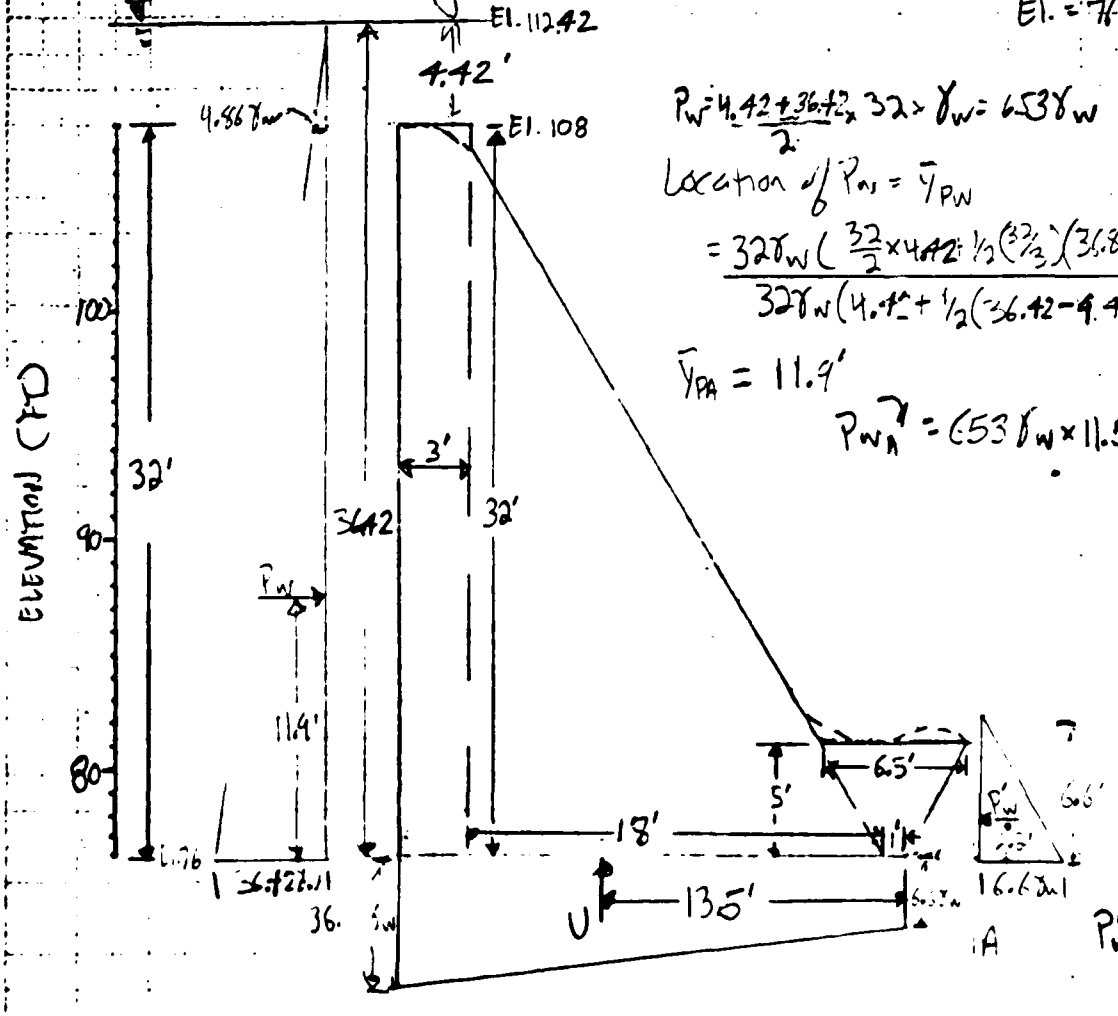
$$S.F.F.S = \frac{\Sigma F_v \tan\phi + cA}{\Sigma F_H} = \frac{616\,\gamma_w \tan 40^\circ + 21(1)}{592.1\,\gamma_w}$$

$$S.F.F.S. = 1.44 < 3.0$$

TAMS

Job No. 1579-11 Sheet 8 of 11
Project Blind Brook Country Club: Phase I Inspection Date 4/30/81
Subject Stability Analysis By G.P.M.
Ch'k. by

Case III: Unusual Loading (½ PMF) ▽ Upstream @ 112.42'; ▽ downstream @ 6.6' deep
El. = 76+6.6 = 82.6'



$P_w = \frac{4.42+36.42}{2} \times 32 \times \gamma_w = 653\gamma_w$ K/LF

Location of $P_w = \bar{y}_{Pw}$

$= \frac{32\gamma_w\left(\frac{32}{2}\times 4.42 + \frac{1}{2}\left(\frac{32}{3}\right)(36.86-4.42)\right)}{32\gamma_w(4.42+\frac{1}{2}(36.42-4.42))}$

$\bar{y}_{PA} = 11.9'$

$P_{w_A} = 653\gamma_w \times 11.9 = 7705\gamma_w$ (K-Ft/LF)

Location = 6.6/3 = 2.2'

$P'_w = \frac{1}{2}(6.6)^2\gamma_w$
$= 21.8\gamma_w$ K/LF

For F.S. case, use .6 P_w
use $P'_w = .6 \times 21.8\gamma_w = 13.1\gamma_w$ K/LF
$P'_{w_A} = 13.1\gamma_w \times 2.2 = 28.8\gamma_w$ K-Ft/LF

Uplift Force $= \frac{36.42+6.6}{2}\gamma_w \times 22 = 473\gamma_w = U$

Location of Uplift Force: Distance from Pt. A

$\bar{x}_u = \frac{6.6\gamma_w \times \frac{22^2}{2} + \frac{1}{2}(36.42-6.6)\gamma_w \times 22^2 \times \frac{2}{3}}{6.6\times 22\gamma_w + (36.42-6.6)\times\frac{1}{2}\times 22\gamma_w}$

$= 13.5$ Ft. from Pt. A

$U_A = U \times 13.5 = 473\gamma_w \times 13.5 = 6386\gamma_w$

Scale 1/8" = 1 Ft.

TAMS

Job No. 1574-11 Sheet 9 of 11
Project Blind Brook Country Club - Phase I - Irrigation Date 4/30/81
Subject Stability Analysis By G.P.M.
Ch'k. by JP

Case III : Unusual Loading (½ PMF).

$\Sigma F_H = P_W + T_W = 653\gamma_w \rightarrow - 13.1\gamma_w \leftarrow = 639.9\gamma_w \rightarrow$

$\Sigma F_V = W_T + U_P = 968\gamma_w b - 473\gamma_w b = 495\gamma_w b$ (See Fig. 2 Pg. 4 for W_T and W_{TA})

$\Sigma M_T = W_{TA} \circlearrowright + P'_{WA} \circlearrowright = 13746\gamma_w \circlearrowright + 28.8\gamma_w \circlearrowright = 13774.8\gamma_w \circlearrowright$ (k-ft/LF)

$\Sigma M_U = P_{WA} \circlearrowright + U_A \circlearrowright = 7705\gamma_w \circlearrowright + 6386\gamma_w \circlearrowright = 14091\gamma_w \circlearrowright$ (k-ft/LF)

$$\bar{x}_{res.} = \frac{\Sigma(M_T - M_U)}{\Sigma F_V} = \frac{13774.8\gamma_w - 14091\gamma_w}{495\gamma_w} = -0.64$$

$\frac{b}{3} - \bar{x}_{res} = 7.33 + 0.64 = 7.97$ ft outside middle third

Shear Friction Factor of Safety

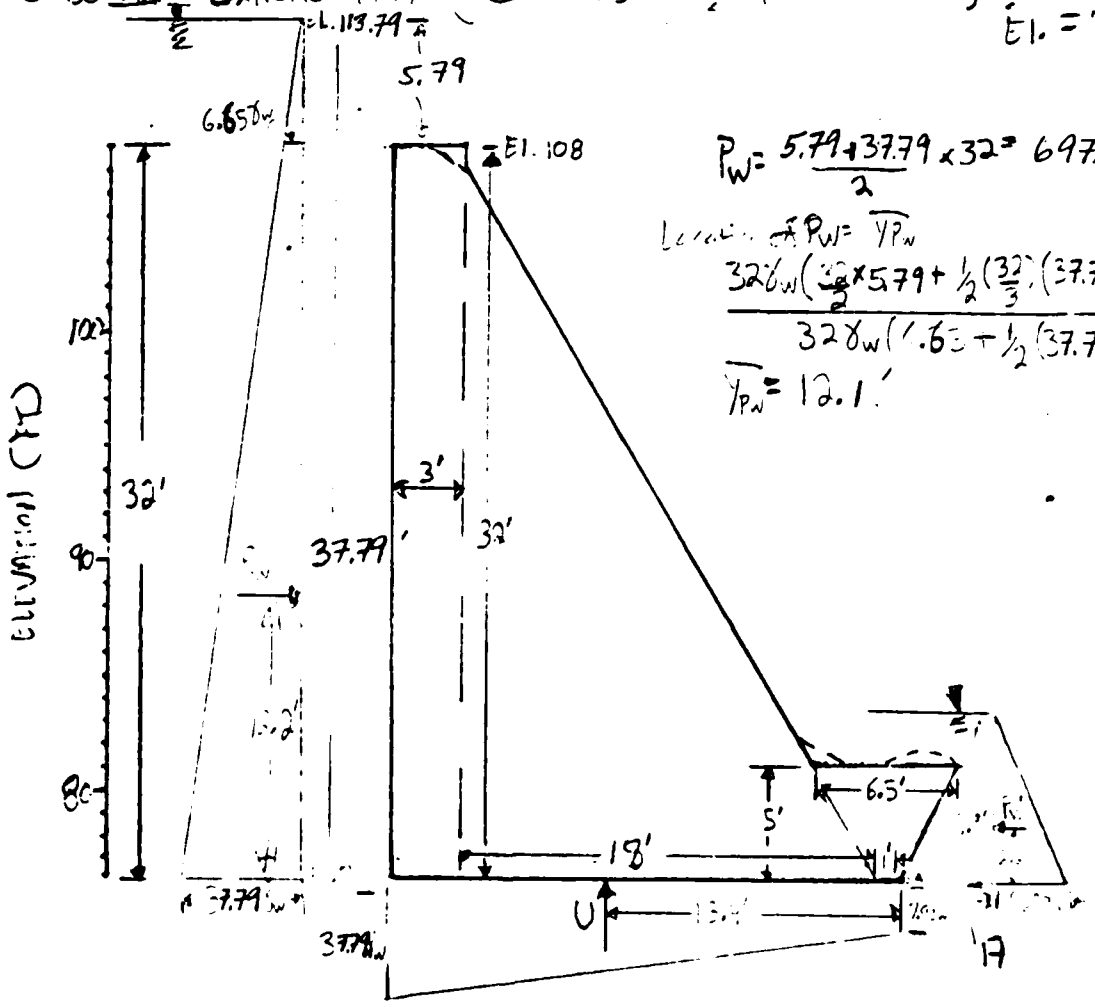
$$\text{Shear F.F.S} = \frac{\Sigma F_V \tan\phi + cA}{\Sigma F_H} = \frac{495\gamma_w \tan 40^\circ + 1(21)}{654.9\gamma_w}$$

S.F.F.S = 1.15 < 3.0

TAMS

Job No. 1579-11 Sheet 10 of 11
Project Blind Brook Country Club: Phase I Investigation Date 4/30/81
Subject Stability Analysis By G.P.M.
Ch'k. by JP

Case III: Extreme Loading (Full PMF) : ½ Upstream @ 115.79'; ½ downstream @ 7.9' depth
El. = 76+7.9 = 83.9



$P_w = \frac{5.79 + 37.79}{2} \times 32 = 697.3$

Location of $P_w = \overline{YP_w}$

$$\overline{YP_w} = \frac{32\gamma_w\left(\frac{32}{2} \times 5.79\right) + \frac{1}{2}\left(\frac{32}{3}\right)(37.79 - 5.79)}{32\gamma_w(1.63) + \frac{1}{2}(37.79 - 5.79)}$$

$\overline{YP_w} = 12.1'$

Uplift Force = $\frac{(37.79 - 7.9)}{2} \times 22 = 503\gamma_w = U$

Location of Uplift Force. Distance from Pt. A

$$\bar{X}_U = \frac{7.9 \times 22\gamma_w \times \frac{22}{2} + \frac{1}{2}(37.79 - 7.9)\gamma_w \times 22 \times \frac{2}{3} \times 22}{7.9 \times 22\gamma_w + (37.79 - 7.9) \times \frac{1}{2} \times 22\gamma_w}$$

Scale 1/8" = 1 ft.

= 13.4 ft. from Pt. A.

Moment about A = $\overrightarrow{U_A} = U \times 13.4 = 5030\gamma_w \times 13.4 = 6740.2\gamma_w$

TAMS

Job No. 1579-11 Sheet 11 of 11
Project Blind Brook Coal Phase I Inspection Date 4/30/91
Subject Stability Analysis By G.P.M.
Ch'k. by JP

CASE III Extreme Loading (FMPMF)

$P_{WA} = 697.3 \times 12.1 = 8437.3$ k-FT/LF

$P_W' = \frac{1}{2} 7.9^2 \gamma_w = 31.2\gamma_w \leftarrow$, $P'_{WA} = 31.2\gamma_w \times 2.6 = 81\gamma_w \uparrow$

Use $.6P_W = .6 \times 31.2\gamma_w = 18.7\gamma_w \leftarrow$, Use $.6P'_{WA} = .6 \times 81\gamma_w = 48.6\gamma_w \uparrow$

$\Sigma F_H = P_W + P_W' = 697.3\gamma_w \rightarrow - 18.7\gamma_w \leftarrow = 678.6\gamma_w \rightarrow$ K/LF.

$\Sigma F_V = W_T \downarrow + U \uparrow = 168\gamma_w \downarrow + 303\gamma_w \uparrow = 465\gamma_w \uparrow$ (See Fig. 6 Pg 4 for W_T and W_{TA})

$\Sigma M_T = W_{TA} \uparrow + P'_{WA} \uparrow = 13746\gamma_w \uparrow + 48\gamma_w \uparrow = 13794.6\gamma_w \uparrow$ (K-FT/LF)

$\Sigma M_D = P_{WA} \uparrow + U_A \uparrow = 8437.3\gamma_w \uparrow + 6740.2\gamma_w \uparrow = 15177.5\gamma_w \uparrow$

$$\bar{x}_{res.} = \frac{\Sigma(M_T - M_D)}{\Sigma F_V} = \frac{13794.6\gamma_w - 15177.5\gamma_w}{456\gamma_w}$$

$= -3.0$ ft

$\frac{b}{3} - \bar{x}_{res} = 7.33 + 3.0 = 10.33$ ft outside middle third

Shear Friction Factor of Safety:

$$S.F.S. = \frac{\Sigma F_V \tan\phi + cA}{\Sigma F_H} = \frac{465\gamma_w \tan 40 + (21)}{706.1\gamma_w}$$ ∴ No Good.

$S.F.S. = 1.05 < 1.5$

REFERENCES

APPENDIX F

REFERENCES

1. "Flood Hydrograph Package (HEC-1) Users Manual for Dam Safety Investigations", U.S. Army Corps of Engineers, Hydrologic Engineering Center, September 1979.

2. "Seasonal Variation of the Probable Maximum Precipitation, East of the 105th Meridian for Areas from 10 to 1,000 Square Miles, and Durations of 6, 12, 24 and 48 Hours", Hydrometeorological Report No. 33. Weather Bureau, U.S. Department of Commerce, April 1956.

3. "Recommended Guidelines for Safety Inspection of Dams", Department of the Army, Office of the Chief of Engineers, Appendix D.

4. "New Englad Upland Section", Internal Report, Civil Engineering Department, Purdue University, West Lafayette, Indiana, August 1977.

5. Geologic Map of New York, The University of the State of New York, The State Education Department, Map and Chart Series No. 5, Albany, New York, 1962.

OTHER DATA

APPENDIX G

DAM DAM INSPECTION REPORT

RB	CTY	YR AP.	DAM NO. 237C	INS. DATE	USE	TYPE
24	60	59	002747	04061272	01	4

AS BUILT INFORMATION

1	Location of Sp'way and outlet	1	Elevations
1	Size of Sp'way and Outlet	1	Geometry of Non-overflow section

GENERAL CONDITION OF NON-OVERFLOW SECTION

1

1	Settlement	1	Cracks	1	Deflections
1	Joints	2	Surface of Concrete	1	Leakage
1	Undermining	1	Settlement of Embankment	1	Crest of Dam
1	Downstream Slope	1	Upstream Slope	1	Toe of Slope

GENERAL COND. OF SP'WAY AND OUTLET WORKS

1

2	Auxiliary Spillway	2	Service or Concrete Sp'way	1	Stilling Basin
2	Joints	2	Surface of Concrete	1	Spillway Toe
2	Mechanical Equipment	1	Plunge Pool	1	Drain

1	Maintenance	1	Hazard Class
3	Evaluation	4	Inspector

COMMENTS: